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ABSTRACT

The activities of the United Nations Educational, Scientific, and Cultural Organization (UNESCO) workshop on the development of a systems approach to teacher inservice education in Asian and Oceanic nations are reported. Eighteen participants from twelve countries are listed. Topics addressed by the workshop include: 1) general problems in the current educational systems of the participating nations; 2) the feasibility of a systems approach to teacher education; 3) the objectives of education, and methods which may be used to identify educational objectives; 4) the role of evaluation in systems analysis; 5) the reports of three syndicate task forces within the main structure of the workshop; and, 6) recommendations for national and regional follow-up plans to implement the conclusions reached by the workshop participants. (LH)

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ED186359

LEARNING TO CHANGE

Report of a Regional Training Workshop on
Systems Approach for Education-
Teacher In-Service Programme (SAFE-TIP)

U S DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

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Chapter One

INTRODUCTION

Implementing Resolution 1.151 adopted by the General Conference of Unesco at its Nineteenth Session, a Regional Workshop on Systems Approach for Education - Teacher In-service Programme (SAFE-TIP) was held from 20 November to 2 December, at the Unesco Regional Office for Education in Asia and Oceania, Bangkok, Thailand.

Planning phase

In preparation for the Workshop, a Planning Group of Experts from the region met at the Unesco Office in Bangkok from 3-10 October 1977 and provided guidance regarding:

1. Scope and focus;
2. Objectives and products;
3. Main tasks related to the objectives;
4. Themes;
5. Organization; and
6. Evaluation.[1]

Pre-workshop phase

A pre-workshop preparation phase for the participants preceded the Workshop, and involved the participants in about 60 hours of work over five months, in their own countries. During this phase, participants were provided with:

1. The Prospectus of the workshop;
2. A package of self-learning materials consisting of: An Introduction to Systems Approach; the Basic concepts set, including cassette; a Goal-oriented model for the

1. See Planning Group of Experts for a Regional Workshop on Systems Approach for Education - Teacher-In-service Programme (SAFE-TIP), Unesco, Bangkok, 3-10 October 1977. *Report*. Bangkok, Unesco, 1977. 26 p.

learning/teaching situation; A systems approach to learning/teaching equipment provision; Learning/teaching process - a systems analysis;

3. Three illustrative case studies;
4. Work sheets on PERT analysis;[2]
5. Sample flow diagrams;
6. A package of programmed materials on the application of systems approach to the development of a technical teacher education programme;
7. A systems approach to teaching and learning procedures Unesco, Paris, (1975);
8. Strategies, methods and media, Unesco, Paris, (1978).

Participants submitted the following assignments one month before the Workshop, for processing and for preparing supportive working papers for use at the Workshop:

1. A list of ten problems specific to the participant's country, related to educating learners in the age-group 5/6 years to 14 years, categorized in priority order;
2. An analysis of selected problems;
3. A case study at the macro-level connected with the organization of in-service education of teachers at the first level of education;
4. A case study at the micro-level connected with the organization of in-service education of teachers at the first level of education.

Inauguration

Mr. Raja Roy Singh, Director of the Unesco Regional Office for Education in Asia and Oceania, inaugurated the Workshop. In his opening remarks, he stressed the need to judge the functionality of systems approach in practical situations facing the Member States, and in this context he urged the participants

2. PERT = Programme Evaluation Review Technique.

to consider the attitudes, skills and knowledge that may be required for effective use of the approach in solving the critical educational problems facing the Member States.

The participants

Eighteen participants from 12 countries in the region attended the Workshop (Annex I : List of Participants). UNICEF sponsored one participant and one observer.

The following participants acted as office bearers of the Workshop. Together with the resource persons and Unesco staff, they also constituted the Steering and Monitoring Committee of the Workshop.

Co-Chairmen	Co-Rapporteurs
Mr. Habib-ur-Rehman (Pakistan)	Mr. Francis Wu Ven Yuen (Singapore)
Mrs. Balbina N. Codilla (Philippines)	Mr. Malik Ijaz-Ahmed (Pakistan)
Prof. K.C. Panda (India)	Mr. Md. Abdur Rashid Khan (Bangladesh)

Mr. J. Ratnaike, Education Adviser of the Regional Office for Education in Asia and Oceania, served as Secretary to the Workshop.

Facilitators

Dr. C.K. Basu, Miss Kamala Pieris, Mr. T. Wyant, Dr. Nida Sapianchai, Mr. H.N. Edwardes, Dr. Minda Sutaria, and Dr. Alan Williams acted as facilitators at various times in the Workshop.

Workshop sessions

The Workshop activities were specifically designed to complete identified tasks, and reach defined objectives. (See Annex II : Objectives of the Workshop). The Workshop attempted to enhance the knowledge, skills and attitudes of the participants in regard to concepts and techniques of systems approach, not

only through clarification sessions, but also by processing the materials produced by the participants. Gains in knowledge, skills and attitudes were primarily through the 'on-the-job' process of design, execution, and refinement of the various tasks at the Workshop. (See Annex II : Schedule of Work).

A major aspect of the Workshop methodology was the provision for self-development and self-evaluation. The facilitators were available for consultation at the Workshop, and the participants had access to a variety of resource materials in different media. Working papers were provided for each session in order to stimulate discussion. The varied experiences and competencies which the participants brought to the Workshop were important elements of the learning environment.

Discussions took place at plenary, and syndicate (small-group) sessions. Syndicate work was presented at subsequent plenary sessions for further discussion and approval by the participants.

Evaluation of the Workshop was designed by the participants themselves, after a general discussion on criteria, and the results again were discussed at a plenary session. The final plenary session adopted this Report.

Acknowledgements

The participants expressed their gratitude to the facilitators for their invaluable contributions during the Workshop, and conveyed their thanks to Unesco for making the Workshop possible and for conducting it effectively and efficiently.

The participants placed on record their appreciation of the many personal generosities provided by the Thai delegation, which permitted them to see the culture and life in Thailand at first hand.

Chapter Two

PROBLEMS IN THE EDUCATION SYSTEM

Participants made known to the Workshop, through their assignments, a large number of problems related to the first level of education, ranging from those involving teachers to those associated with resources, and problems such as: learning/teaching methodologies, language, urban/rural and sex discrimination, drop-out and wastage, evaluation, community involvement, and management.

In spite of the very considerable quantitative expansion of educational systems in all countries of the region, the provision of adequate and relevant basic educational opportunities remains a problem of the highest priority. Many countries in the region have recognized that the first cycle of education has to be considered a pre-condition for any development strategy based upon the optimum use of productive human resources.

Towards the goal of basic functional education for all, countries in the region have already initiated major and far-reaching reforms in the content, structure and methodologies for education at the first cycle of education. While effective plans have been designed, however, implementation has been fraught with severe problems. Of these problems, one of the most severe, considering the magnitude and the urgency, is the reorientation and upgrading of teachers and other personnel responsible for the delivery of education to learners in the age group 5/6 years to 14 years. The belief that a major educational reform, notably one involving changes in learning systems, can be brought about while bypassing teachers, or that educational media will replace substantially the teacher's roles, has proved illusory in the region.

The problem of in-service education for the large numbers of often underqualified teachers[1] and other personnel at the first cycle of education, scattered as they are across the farthest corners of a country, is a major 'macro' problem. It involves questions on a massive scale having to do with such elements as organization, management, administration, finance and deployment. It is also a 'micro' problem

1. The term 'teacher' as used in this report, is not limited to the classroom in the traditional sense. It includes all those who perform a teaching role; for example, resource persons drawn from the community in formal, informal and hybrid education programmes.

at any given in-service session. Problems at this 'micro' level arise from the attributes of design of such a session - its context, entry attitudes of the learners, methodologies, learning sequences, opportunities for reinforcement and application of learning, and other dimensions in the 'micro' system, at the inter-face between the 'teacher educator' and the teacher undergoing in-service education. Special attention needs to be paid to the implications for teacher education, such as having adequate educational inputs reach the young learners in rural and other disadvantaged areas of a country.

By far, the highest emphasis in the responses from participants was given to the problems of various kinds of teachers, which validated the choice of one of the topics of the Workshop - the in-service education of teachers at the first level of education.

Within the area concerned with teachers, the following issues were considered especially significant:

a) Alternative approaches in the preparation of teachers (and other educational personnel);

b) New techniques in the preparation of teachers (and other educational personnel), including modular modes, material aids and assessments;

c) Strategies for the mass implementation of programmes for the preparation of teachers (and other educational personnel);

d) Continuing education of teachers (and other educational personnel).

The major issues that formed the basis for discussion were the following:

1. Alternative approaches in the preparation of teachers (and other educational personnel)

   a) Linkages between schools (their conditions and curricula), and teacher-education institutions (pre- and in-service) are essential, to remove the isolation of these institutions from the realities of field situations.

   b) Participating directly in the educational reform programmes, from design aspects to implementation and monitoring, is an effective strategy that teacher education institutions can use in making their own programmes relevant to the needs of the country.

   c) Teacher education designs specifically oriented towards competence, are becoming increasingly important, especially in

the context of the urgency to train large numbers of teachers, either by means of initial training, or as in-service training in support of curriculum reform.

d) With greater emphasis on disadvantaged populations, the implications of sustained poverty conditions on learning become priority issues for teacher education programmes;

e) Deformalization of the formal system of education, and enhancement of formal-informal hybrid modes for the delivery of education to a variety of populations at intermittent time periods, have fundamental implications for content and methodologies being considered for teacher education programmes.

2. New techniques in the preparation of teachers (and other educational personnel)

a) The movement towards specificity in defining minimum teacher competencies and the need for reaching large numbers of teachers in remote areas are providing a boost to the use of modular modes in teacher education, although difficulties and constraints in the design, development and deployment of such materials are also recognized;

b) Modular modes for learners are being used increasingly in the school system. Teacher education programmes have to recognize this trend in their designs by providing opportunities for the trainees to be exposed to such modes;

c) Of special importance is the initiation of remedial and compensatory study sequences for learners from disadvantaged populations, which demand special competencies from teachers and corresponding changes in teacher education programmes.

Material aids

a) The choice between commercially-produced expensive materials and low-cost teacher-made items has to be made with relevance to the organizing principle, and to the function, cost, usage and maintenance of such items;

b) The matching of material aids in teacher education to the realities of the learning situation in the field is an essential attribute in selecting these aids;

c) Teacher trainees must be actively involved in the study, construction, and use of material aids. This involves not only

contrived aids, but common functional materials found in the home and community, such as kitchen utensils, farm implements, and indigenous toys, so that competencies in seeing in a variety of such items potentiality for use as aids in learning situations may be developed;

d) With the movement of education towards making its contribution to rural transformation, the range of material aids for learning increases, to include such items as bio-gas plants, irrigation pumps, solar heaters, sanitary latrines, compost pits and fish ponds;

e) There is a strong need to do more in the way of incorporating aids, and instructions for their construction and use, in curricular materials for the teacher and learner, and for teacher training programmes to use such materials as integral components of their activities.

Assessment

Although it is more common to assess teachers' competence by examining the various competencies separately, more attention should be given to an assessment of the teachers' capacity to marshal all their abilities in learning situations. For this purpose, the best indicator of teacher performance is the change in ability of the pupil. A major difficulty is the resolution of the change in ability into the component produced by the teacher, and other components produced by 'non-teacher' interventions.

a) Where it is necessary to give an overall assessment of a teacher's potential competence after evaluating a number of components in his or her overall skill, it is suggested that this be done by finding the product or geometrical mean of the various marks rather than the sum of the arithmetical mean;

b) It is essential to devise urgently techniques for the evaluation of the minimum acceptable performance of the teacher trainee at teacher education institutions, and of subsequent additional competencies, particularly in the context of mass and rapid training of teachers;

c) An introduction of mastery learning in school-course planning, requires skill in the use of criteria-referenced tests, remedial measures, and summative evaluation.

3. Strategies for mass implementation of programmes for the preparation of teachers (and other educational personnel)

a) Many educational innovations involve major system transformations. They may be understood as aspects of deliberate intervention into the fabric of the culture. In this context, it should be recognized that society has its own processes of cultural screening, re-definition and re-interpretation.

b) Long-term planning for all aspects of mass implementation, and early warning of the variety of agencies that may be involved, is a strategy shown to be effective in supporting mass implementation. However, the political and other realities may not permit such systematic and long-term action.

c) Often, developing countries may not be able to await detailed research findings before mass implementation. Action research and 'rolling reform', are effective techniques in mass implementation under time constraints.

d) The sharing of experiences of countries in the region, in their pioneer efforts for mass implementation of changes, would be most valuable.

e) Appropriate traditional and modern media and infrastructures that have extensive reach must be used to gain acceptance and overcome resistance, such as some of the modalities of project support communication prior to, and during, implementation.

f) The 'push and pull' strategies of marketing might well be adapted by educationists to win acceptance of their products among the consumers.

g) While bureaucracies and administrative systems are generally geared to 'maintaining' rather than 'innovating,' and may present serious barriers to educational innovation, their very strengths may nevertheless be channelled to enhance the 'push' effects if their strong influences are brought to bear on critical points of the system, by working, or appearing to work, within the thresholds of bureaucratic risks and tolerances which a particular system is prepared to accommodate.

4. Continuing education of teachers (and other educational personnel)

a) Among the major reasons for rethinking and redesigning continuing education of educational personnel, and rationalizing and interlinking it closely with pre-service education are: the delivery of a minimum package of competencies at mastery

levels, at pre-service education institutions, followed by a subsequent layering pattern with continuing education providing for further competencies as the situations demand; the improvement of implementation problems in the field situation; and the need for educational personnel to have competencies to deal with new problems as the education systems and societies develop.

b) Relationships of pre-service education to continuing education imply a variety of interactions and interchanges for continuity, integration and feedback mechanisms, so as to ensure that no institution, programme, or level, becomes isolated from others.

c) The problem of motivation for continuing education is serious, and as yet suitable comprehensive solutions have not been found.

d) The distance of travel to gain continuing education is a serious inhibiting factor.

e) The establishment of decentralized resource centres within easy reach of the client populations, and sensitive to the needs of these populations, would provide one mechanism for propagating effective and relevant continuing education.

f) A strong element of research in planning for and implementing programmes of continuing education is keenly felt.

Chapter Three

A SYSTEMS APPROACH FOR EDUCATION

Introduction

Concurrent changes in the social milieu in which education systems are embedded, have led to the emergence of complex problems which may no longer be solved by mere intuitive judgement or educated guesses. This situation calls for the adoption of an approach to solving problems which would improve both the process and the outcomes of decision-making in curriculum development, planning and implementing pre-service and in-service education programmes, and allocating scarce educational resources. The systems approach has emerged as an effective alternative for improving these processes and their outcomes.

What is the systems approach?

The systems approach is a process for the application of logical thinking in the solution of problems. Its nature derives from the term 'system' which, in a broad sense, is a set of parts united together in an interactive and interdependent manner, to achieve specified objectives.

The systems approach is thus a technique for understanding, predicting and controlling the interaction and interdependence of the major parts of a system in a given situation, to achieve specified objectives. In adopting the systems approach, the educationist would:

- identify the major problems;
- specify objectives for action;
- analyse tasks involved in achieving the objective;
- thoroughly assess the total input and constraints of the system;
- propose alternative strategies;
- evaluate and identify the preferred solution in a given context;
- design the preferred solution in a given context; and
- modify components and systems operation based on feedback data and continued evaluation.

The term systems approach is used here as a general term for a systematic process without implying any unique approach, but embracing both analysis and design. When it is adopted to study a system, it is called 'system analysis.' A system analysis of education may be compared to what a physician does when he examines a human body - a most complicated and awe-inspiring system. While an educational system differs greatly from the human body, like all other man-made or natural systems; it has a set of inputs which are subject to a process designed to produce certain outputs which are intended to meet the requirements of the system objectives.

To determine whether the human body is functioning well, it is not necessary to look into all the components of the human body. By looking into certain critical indices of health, such as blood pressure, pulse, temperature or weight, a physician can tell whether or not an individual is healthy.

In a similar manner, to evaluate an educational system, that is, to find out if it is meeting the requirements of its objectives, critical indicators may be identified which would show whether there is a need to make adjustments to ensure the achievement of the objectives.

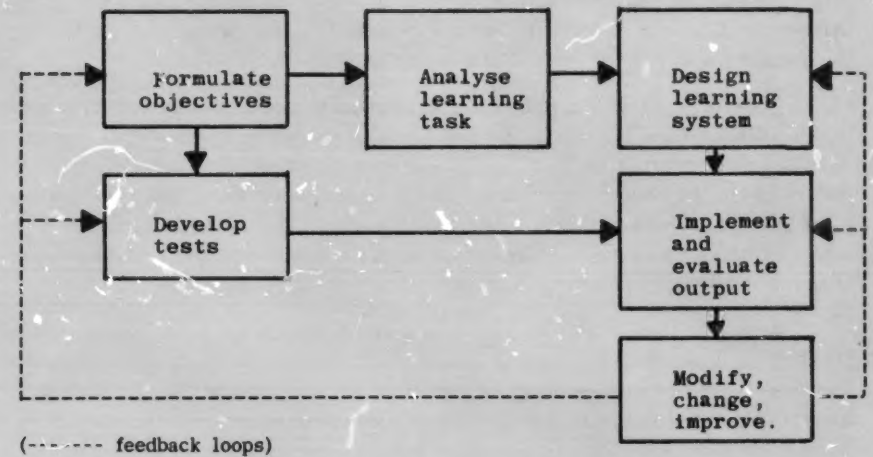
The systems approach may be utilized in an unlimited number of situations which call for analysis and design. One such situation is the development of a curriculum or an in-service education programme for teachers and other personnel.

In designing such in-service education programmes, certain factors need to be taken into consideration. These factors include the requirements of the task, the needs and limitations of the learners, and the socio-cultural environment in which they are a part. These are scrutinized in a situational analysis which must precede the process of designing the programme.

Such a situational analysis makes the designer aware of constraints which would be counterproductive, and helps to determine which among the strategies proposed is best suited to the purpose. It also increases the awareness of the resources that may be harnessed in the implementation of the strategy to be adapted.

Although there is no standard diagram showing the interrelationships and the process involved in the development of a learning system, a flow chart, as presented in Figure 1, is often used to represent the various components of the system and their interaction with one another, and provide feedback which gives cues for adjustment at each stage.

Figure 1. A Systems Flow Chart



A goal-oriented learning model

Teachers who realize that they have to make a decision on what will take place during a session in the classroom, often ask the question, 'What shall I do?' This is a realistic approach to the situation, because in most personal decisions, an individual tends to consider first what has to be done. In instruction, however, it may not be the right question to ask. The appropriate question to ask is maybe 'What do I want my learners to become?'

In asking this question, the teacher must consider what the legitimate goals of education are, for these imply what he or she must help the learners to attain. He or she must also consider that the learners are to be involved in deciding what they are to become.

What's wrong with asking the question, 'What shall I do?' While it gives the impression of dynamism on the part of the teacher, it can focus greater attention on elements of lower priority in the learning/teaching situation. It often makes the teacher more concerned with the instructional means rather than with the results that these means are supposed to produce.

This undue concern for instructional means may (for example) make the teacher emulate certain instructional sequences which the teacher found satisfying as a pupil many years ago, or which were observed as 'highly stimulating.' The consequence is often the employment of strategies that are enjoyable but not beneficial, and which do not produce the results desired.

Sometimes the reason why teachers are more concerned with the means rather than the ends, is that the behaviour of many supervisors reflects the persuasion that teaching efficiency can be judged mainly in terms of the instructional means which the teacher employs. There is a belief that by observing a teaching session in the classroom, the supervisor can draw accurate inferences regarding teaching competence. Many school supervisory schemes are based on this assumption.

A supervisor visits a classroom and takes note of the instructional strategies employed by the teacher. The supervisor then meets with the teacher to discuss the strengths and weaknesses of teaching, and suggests ways of improving techniques. These discussions are usually based on the assumption that the supervisor knows something about which techniques that are preferable. Sometimes, the standards a supervisor follows in judging someone else's teaching procedures, are based on the procedures used long ago when the supervisor was a teacher.

The reason for the presence of the teacher in the classroom is the modification of the behaviour of the learners in accordance with recognized objectives. Effective instruction must therefore be defined as the capacity to bring about desired change in the abilities and perceptions of the learner. There is sufficient research evidence that indicates that no single teacher action is invariably associated with learner achievement. There is thus no such thing as a 'cut and dried' formula for effective learning.

Conceptions of instruction that are means-oriented are inadequate for purposes of decision making in the design of learning situations. Instead of asking 'What shall I do?', the teacher may ask, 'What do I want my learners to become?' which is the essence of a goal-oriented learning model. It must be emphasized that 'What the teacher wants the learners to become' is something that is to be decided by the learners themselves, under the intelligent guidance of the teacher.

Rationale for the model

A goal-oriented learning model focusses initially on what observable behaviours the learner should possess at the end of instruction. Once the instructional goals are specified, the selection of learning strategies or means becomes more direct and effective, because these

strategies must flow from the goal.

When a teacher is very well aware of what kind of behaviour a specific learning event is supposed to produce, opportunities for learners to practise behaviours consistent with the desired objectives may be built into the learning unit. The teacher will avoid choosing activities merely as 'time fillers'.

There are a number of advantages of a goal-oriented learning model. One is that it guides the teacher in the initial selection of learning activities. A second advantage is that it permits the teacher, over time, to improve the quality of learning sequences. A teacher using a goal-oriented learning model has clear standards on which to base adjustments to procedures and evaluative strategies.

Many teachers are pleased when the class session ends "without a hitch." If the criterion of success is learning rather than mere smooth functioning, however, the session may even have been a failure. A productive way to judge the success of a class session is to measure the performance of the learners, and compare it with the performance criteria established before the learning event.

The model

The learning model described here, adopts a systems approach. It is a scheme featuring five well-known basic steps. It emphasizes the decision-making process the teacher engages in before and after instruction, and, as such, is really more a planning and assessment model than a teaching scheme.

First, the objectives are specified in terms of learner behaviour. Second, the learners are assessed as to where they are with respect to what they are to learn, so that if they are not ready for it, they will be helped to become ready. Third, the instructional sequence which will bring about the attainment of the specified objectives is designed and implemented. Fourth, the learners' attainment of the specified objectives is evaluated. Fifth, if that attainment does not meet the expectancies, adjustments to the instruction are made so that the expectancies are fulfilled, or if the learners show mastery of what has been taught, the adjustments made on instruction should result in extending the mastery. The five steps given above constitute the goal-oriented learning model illustrated in the diagram, which, if adopted or adapted, may improve learning. The model is illustrated in the flow chart in Figure 2. Teachers can design their own system to suit the particular learning situation.

Specification of objectives. The scheme requires that the goals be stated clearly in learner-behaviour terms and that the task be

sequenced in a way that will foster maximum learning; i.e., from easy-to-difficult, or in logical steps, so that one learning builds on a prerequisite learning or reinforces it.

Pre-assessment. The second step in the scheme requires that the teacher identify the learners' entry behaviour; i.e., the learners' skill rather than pre-testing is used because the former suggests more varied procedures, while the latter often seems to be limited to paper-and-pencil tests.

An analysis of learners' entry behaviour may lead to a decision to add or drop certain objectives, or to provide activities which would prepare them for the new lesson, or to vary the objectives or procedures to suit specific learners in the class.

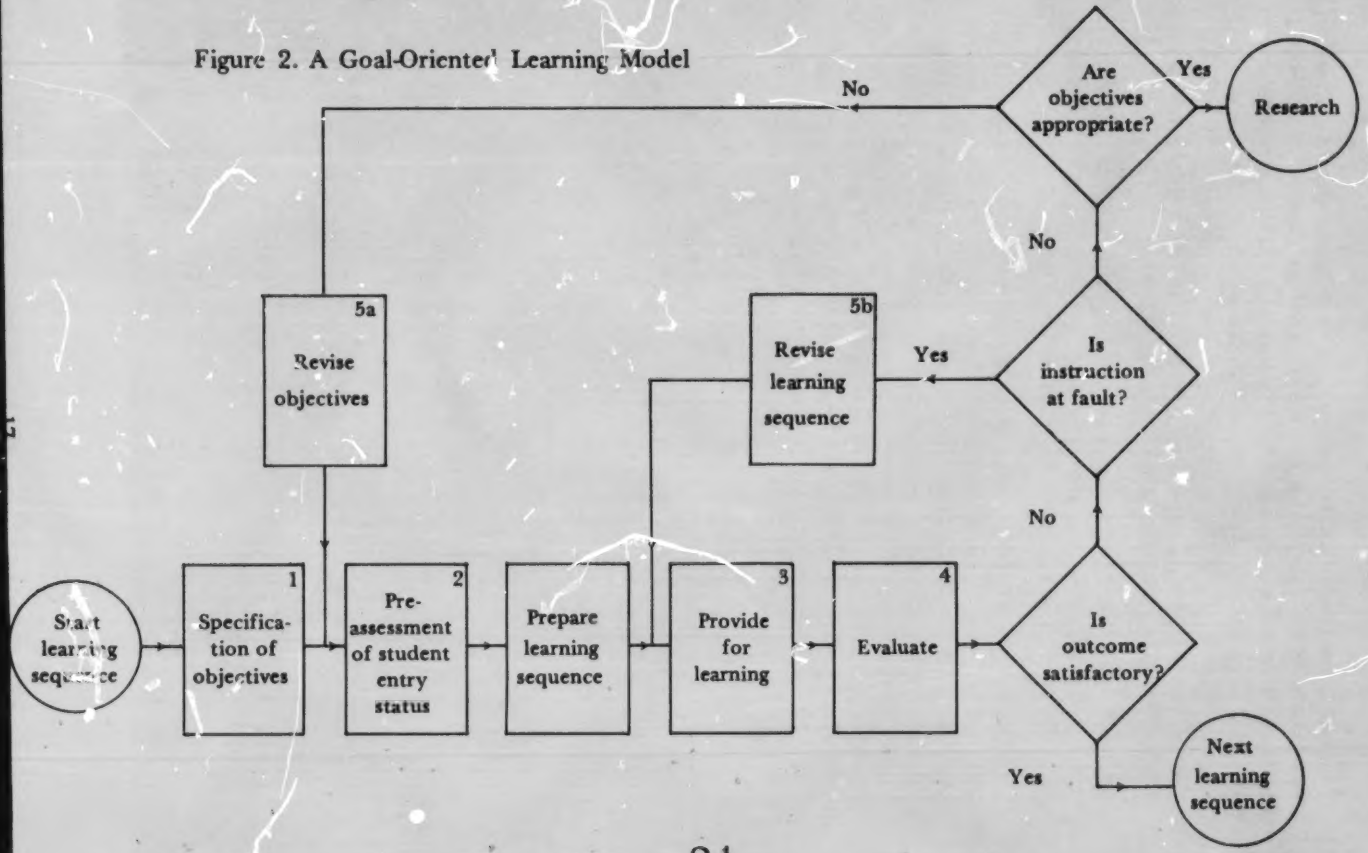
Learning. In the third step, in which decisions are made on what learning activities to provide, and in which these decisions are implemented, the guiding principle is the 'specified objective'. The principle of appropriate practice must also be followed in this step. It suggests that the teacher provide opportunities for the learners to practise the behaviour called for in the specified objective. This means that if the teacher intends to have the learners acquire a particular skill, the opportunity must be provided to practice that skill during the learning sequence. This requires that the teacher integrate theory and practice by providing opportunities for the application of what is learned to the organizing of lessons which call for the unification of study and work.

In this regard, the concept of education as the art of the utilization of knowledge will prove useful, for any knowledge that is not used remains inert and thus fails to qualify as a part of education.

Evaluation. It is in the fourth step that the teacher finds out whether the learners can actually behave as planned. It must be emphasized that paper-and-pencil tests are not the only means of evaluation. There are a number of formal and informal ways of assessing learners' achievement. Observation, oral and written exercises, self-rating, checklists, homework and projects are some ways that have not yet been well exploited by many teachers. The learners should above all be harnessed to the task of evaluating themselves. Active involvement in assessing oneself can lead to more active involvement in one's own learning, and consequently, greater learning.

One weakness observed in the evaluation process is the lack of congruence between the evaluation scheme and the objectives. Often, the evaluative instrument does not accurately test the achievement of specified objectives or it measures something else, or both. Not uncommonly, the objectives are so stated that they cannot be evaluated.

Figure 2. A Goal-Oriented Learning Model



Evaluation, here, is intended to improve future performance rather than to serve merely as a basis for assigning marks or for selection. This means that when learners fail to reach the pre-specified goals, something may well be wrong with the teachers' course of action; either with the plans the teacher made, or the ways in which they were carried out. Evaluation, therefore produces cues for adjustments that need to be made in the learning process.

On the other hand, if the objectives are achieved, the teacher deserves the credit and may then consider the possibility of augmenting the objectives so that learners can achieve still more.

Adjustment. This final step constitutes the essence of what is sometimes called a feedback correction process. A feedback-correction process cannot be made operational without adequate evaluation. Every learning system needs to strengthen its capacity for adjustment. If evaluation reveals that the objectives have not been attained, it provides feedback which cues the need for adjustment, which is necessarily corrective or remedial in nature. If it reveals mastery of what has been taught, the adjustment may take the form of either reinforcement, or enrichment, or both.

Learner-focused model. The learning model just discussed requires that the teacher focus attention on the learner. This focus is clearly reflected in the question "What do I want my learners to become?."

Chapter Four

OBJECTIVES

The crucial and practical problem in analysing terminal behaviour, is how to describe learning objectives in a manner detailed enough for learning to take place. What the learning situation requires for specifying the terminal behaviour is a set of descriptive categories which indicate how to proceed, since the conditions for efficient learning may undoubtedly be different for different tasks, and for the same task under different learning situations. This problem may be sub-divided into two related and convergent problems which are:

1. The defining of learning objectives;
2. The defining of objectives for learning outcomes or terminal learner behaviour which may be used to develop test items based upon defined criteria.

There is obviously a strong relation between these two, but the former assists especially in designing learning sequences, while the latter assists, in particular, the designing of evaluation tools to discover whether the learners have acquired the intended objectives.

Objectives for designing learning sequences

Several analyses have been made to support the designing of learning sequences, such as those by Gagné. Gagné formulates behaviour categories and suggests the conditions for learning under each, such as below:

1. Response learning—a basic form of learning which is a prerequisite to other learning, echoic in character, with the contiguity of the response following the stimulus as the basic condition.

2. Associations—where a stimulus comes to be associated with a response in a way that in the presence of the stimulus, the response occurs with a high probability. Association learning involves a three-member chain: (a) discrimination of the stimulus from the surrounding environment; (b) the differentiated response available in the learner's repertoire incited by previous response learning; and (c) the previous learning in the learner's entering repertoire which, though not necessarily exhibited by overt behaviour, becomes a meaningful or thematic link between the stimulus and response. The existence of meaningful

associations from the learner's past can provide learning prompts which facilitate the learning process.

3. Multiple discrimination–this consists of basically forming associations, as indicated above, but in the learning of multiple discriminations, there is the added complexity of interference. A condition that facilitates the learning of multiple discriminations is making the stimuli as distinctive as possible to minimize interference. A further condition is the availability of the response required; that is, prior training as a result of the differentiation for the responses that are associated with the various stimuli.

4. Behaviour chains–are single associations put together so that they are performed in a sequential procedure. This requires the learning of individual associations, and multiple discrimination training to prevent interference.

5. Class concepts–these involve similar responses evoked by stimuli which differ in their appearance. The response identifies the stimulus as an example of a particular class, and distinguishes it from examples belonging to other classes. Learning a concept takes place by learning the limits of generalization within classes, and appropriate discrimination between classes. Learning of class concepts would require response learning, and the establishment of stimulus-response associations upon which multiple discriminations and generalizations may proceed.

6. Principles–in the simplest case this is a chain of two concepts. A major condition for principle learning is that concepts which make up the principles must be previously acquired.

7. Strategies–are higher-order rules composed of simpler rules. The stimuli that evoke responses involving the application of rules are novel situations to which various rules must be applied. Such processes are involved in making inferences and in classifying observations, and hence the condition involves discovering the principles applicable to a series of situations that are new to the individual. A prerequisite to learning strategies is the appropriate competence in the categories indicated above.[1]

With this classification (or similar classifications) as a base, the designing of optimal learning sequences is a matter of choosing the proper tactics for each of the categories of behaviour implied. Any set of learning objectives may require one or more, or any combination, of these tactics to ensure that learning occurs most effectively.

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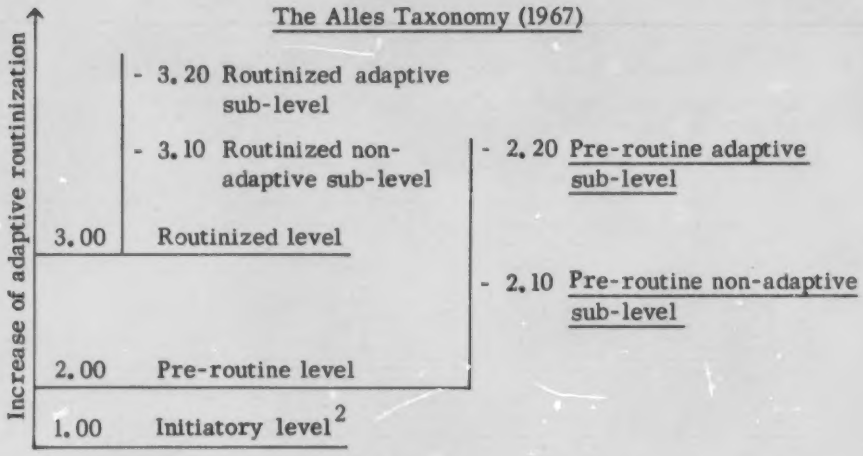
1. R. Gagné, *The conditions of learning*, New York, Holt Rinehart & Winston, 1965.

Learner 'achievement' objectives

A number of classifications or taxonomies are available in this area too, such as those by Bloom, Krathwal and their co-workers for the Cognitive and affective Domains, and the Alles-Dave taxonomy for the Psychomotor Domain. The Cognitive and Affective are indicated below in brief:

Cognitive	Affective
- The cognitive continuum begins with the learner's recall and recognition of knowledge;	- The affective continuum begins with the learner's merely receiving a stimulus and passively attending to it. It extends through the learner's more actively attending to it;
- It extends through the learner's comprehension of knowledge;	- The learner's responding to these stimuli, and taking satisfaction in this responding;
- The learner's skill in application of the knowledge that he comprehends;	- The learner's valuing the phenomenon or activity so that voluntary responses may be forthcoming and the learner may seek out ways to respond;
- The learner's skill in the analysis of situations involving knowledge acquired, and the learner's skill in the synthesis of this knowledge into new organizations;	- The learner conceptualizing each value responded to;
- The learner's skill in evaluation in the given area of knowledge, to judge the value of material and methods for given purposes, using intrinsic and extrinsic criteria.	- The learner organizing these values into systems and finally organizing the value complex - into a single whole - the characterizing of the individual.

At least two analyses of the Psychomotor Domain are available in Asia.


The Alles Taxonomy (1967)
Increase of adaptive routinization
- 3.20 Routinized adaptive sub-level
- 3.10 Routinized non-adaptive sub-level
3.00 Routinized level
- 2.20 Pre-routine adaptive sub-level
- 2.10 Pre-routine non-adaptive sub-level
2.00 Pre-routine level
1.00 Initiatory level[2]

The Dave Taxonomy (1969)

The five levels of the Psychomotor Domain in Dave's analysis from the simplest to the most complex are as follows:

Imitation: Copy of an observed act but lacking neuro-muscular co-ordination.

Manipulation: Copy of an observed act usually following instruction, displaying some neuro-muscular co-ordination.

Precision: Performance of a physical act with accuracy, proportion and exactness.

Articulation: Competent performance of a physical act involving co-ordination of a series of other acts.

Naturalization: Routinization of a physical act to the extent that it becomes an automatic spontaneous and (ultimately) a subconscious response.[3]

Defining objectives behaviourally

The motivations for the 'movement' towards defining objectives 'behaviourally' no doubt arose from the tendency of educational designers to state their objectives in such broad terms that the expected learning outcomes were too vague and ambiguous either to develop learning sequences or to develop test items. However, as a result, the 'swing' to 'behaviours' often resulted in swinging completely into trivia such as:

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2. Jinapala Alles et al, *Theoretical constructs in curriculum development and evaluation*, [Colombo], Ceylon, Ministry of Education, 1967.

3. R.H. Dave, *Taxonomy of educational objectives and achievement testing*, in "Development in educational testing, I," London, Univ. of London Press, 1969.

- the learner will be able to brush his hair;
- the learner will be able to straighten his eyebrows;
- the learner will be able to bend his third finger to an angle of 5° at 09.00 hours on a Monday morning when the temperature is 29° C, the humidity 80 per cent, the atmospheric pressure 1 Atm., standing 6 metres from a window emitting 80 lumens, on a 5-cm rubber-bottomed pair of shoes made in his own country and costing no more than 8 Rs....

Naturally, for a learning situation, (though this method of defining objectives may, for a while, be a mildly stimulating game) such sets of trivia usually turn out to be incomplete accounts of all the learner does or can do. Even if a comprehensive list is attempted, it would be an 'infinite set' unusable for both developing learning sequences and test items. Also, these 'trivia' lists of behavioural objectives are dominated by the lowest levels of the cognitive domain, to the neglect of the more complex cognitive operations, and they hardly ever refer to the affective or psychomotor domains.

It is possible to break away from the 'trivia trap' and provide the designer of objectives (curriculum developer/teacher-educator/teacher), with a set of guidelines by using any of the available taxonomies of the cognitive, affective or psychomotor domains, without descending into trivia. The guidelines would also provide flexibility for the individual choice of content which would be the 'vehicle' for achieving the objectives.

To illustrate this process, merely as an example, the Cognitive Domain classification is taken.[4] The first step is to divide the taxonomy descriptions into two columns - the 'infinitives' and the 'direct objects', thus, (for example) using the following breakdown:

		Infinitives	Direct Objects
1.11	Knowledge of terminology	to define, to distinguish, to acquire, to identify, to recall, to recognize	vocabulary, terms, meanings, definitions, reference, elements.

an objective may be stated thus: The learner distinguishes terms.

The operation involves selecting from the infinitives column first and the objects column next. This leaves the designer with the opportunity of choosing the content area from which, for the particular learning

4. See Table 1, p. 24-28, A check-list of infinitives and direct objects for the cognitive domain.

situation, the terms may need to come i.e. 'Levers' in physics or 'Family' in social studies or 'Denominator' in mathematics or 'Vannama' in music (of Sri Lanka). Other elements in the taxonomy may be similarly utilized:

1.23	Knowledge of classifications and categories.	- The learner identifies arrangements.
2.20	Interpretation.	- The learner differentiates essentials.
3.00	Application.	- The learner restructures procedures.
4.2	Analysis of relationships.	- The learner distinguishes fallacies in evidence.
5.20	Production of a plan or proposed set of operations.	- The learner specifies operations.

Thus, with a comprehensive checklist of infinitives and direct objects, the laborious process of defining behavioural objectives can be greatly reduced, and chances of escaping into trivia effectively checked. One example of such a checklist for the Cognitive Domain (Bloom) is given in Table 1, and similar checklists may be developed for any other taxonomy available for the cognitive domain and for the taxonomies available for the affective and psychomotor domains.[5] In writing learning objectives, the total statement should still specify:

What the learner is expected to be able to do;

How well or to what standard the behaviour is expected to be performed; and

Under what circumstances the learner is expected to perform the behaviour.

Table 1. A check-list of infinitives and direct objects for the cognitive domain

Taxonomy	Classification	Infinitives	Direct objects
1.00	Knowledge		
1.10	Knowledge of specifics		

5. B.S. Bloom, (1956) *Taxonomy of educational objectives: the classification of educational goals*, Handbook I, Cognitive Domain, New York, McKay, 1956.

Taxonomy	Classification	Infinitives	Direct objects
1.11	Knowledge of terminology	to define, to distinguish, to acquire, to identify, to recall, to recognize	vocabularly, terms, terminology, meanings, definitions, references, elements
1.12	Knowledge of specific facts	to recall, to recognize, to acquire, to identify	facts, factual information (sources, names, dates, events, time periods), properties, examples, phenomena
1.20	Knowledge of ways and means of dealing with specifics		
1.21	Knowledge of conventions	to recall, to identify, to recognize, to acquire	forms, conventions, uses, usage, rules, ways, devices, symbols, representations, styles, formats
1.22	Knowledge of trends, sequences	to recall, to recognize, to acquire, to identify	actions, processes, movements, continuity, developments, trends, sequences, causes, relationships, forces, influences
1.23	Knowledge of classifications and categories	to recall, to recognize, to acquire, to identify	areas, types, features, classes, sets, divisions, arrangements, classifications, categories
1.24	Knowledge of criteria	to recall, to recognize, to acquire, to identify	criteria, basics, elements
1.25	Knowledge of methodology	to recall, to recognize, to acquire, to identify	methods, techniques, approaches, uses, procedures, treatment

Taxonomy	Classification	Infinitives	Direct objects
1.30	Knowledge of the universals and abstractions in a field		
1.31	Knowledge of principles and generalizations	to recall, to recognize, to acquire, to identify	principles, generalizations, propositions fundamentals, laws, principal elements, implications
1.32	Knowledge of theories and structures	to recall, to recognize, to acquire, to idenfy	theories, bases, interrelations, structures organizations, formulations
2.00	Comprehension		
2.10	Translation	to translate, to transform, to give in own words, to illustrate, to prepare, to read, to represent, to change, to rephrase, to restate	meanings, samples definitions, abstractions, representations, words, phrases
2.20	Interpretation	to interpret, to reorder, to rearrange, to differentiate, to distinguish, to make, to draw, to explain, to demonstrate	relevancies, relationships, essentials, aspects, new views, qualifications, conclusions, methods, theories, abstractions
2.30	Extrapolation	to estimate, to infer, to conclude, to predict, to differentiate, to determine, to extend, to interpolate, to extrapolate, to fill in, to draw	consequences, implications, conclusions, factors, ramifications, meanings, corollaries, effects, probabilities

Taxonomy	Classification	Infinitives	Direct objects
3.00	Application	to apply, to generalize, to relate, to choose, to develop, to organize, to use, to employ, to transfer, to restructure, to classify	principles, laws, conclusions, effects, methods, theories, abstractions, situations, generalizations, processes, phenomena, procedures
4.00	Analysis		
4.10	Analysis of elements	to distinguish, to detect, to identify to classify, to discriminate, to recognize, to categorize, to deduce	elements, hypothesis/ hypotheses, conclusions, assumptions, statements (of fact), statements (of intent), arguments, particulars
4.20	Analysis of relationships	to analyse, to contrast, to compare, to distinguish, to deduce	relationships, interrelations, relevance, relevancies, themes, evidence fallacies, arguments, cause-effects, consistencies, parts, ideas, assumptions
4.30	Analysis of organizational principles	to analyse, to distinguish, to detect, to deduce	forms, patterns, purposes, points of views, techniques, biases, structures, themes, arrangements, organizations
5.00	Synthesis		
5.10	Production of a unique communication	to write, to tell, to relate, to produce, to constitute, to transmit,	structures, patterns, products, performances, designs, works, communications, efforts,

Taxonomy	Classification	Infinitives	Direct objects
		to originate, to modify, to document	specifics, compositions
5.20	Production of a plan, or proposed set of operations	to propose, to plan, to produce, to design, to modify, to specify	plans, objectives, specifications, schematics, operations, ways, solutions, means
5.30	Derivation of a set of abstract relations	to produce, to derive, to develop, to combine, to organize, to synthesize, to classify, to deduce, to develop, to formulate, to modify	phenomena, taxonomies, concepts, schemes, theories, relationships, abstractions, generalizations, hypotheses, perceptions, ways, discoveries
6.00	Evaluation		
6.10	Judgments in terms of internal evidence	to judge, to argue, to validate, to assess, to decide	accuracy/accuracies, consistency/consistencies, fallacies, reliability, flaws, errors, precision, exactness
6.20	Judgments in terms of external criteria	to judge, to argue, to consider, to compare, to contrast, to standardize, to appraise	ends, means, efficiency, economy, utility, alternatives, courses of action, standards, theories, generalizations

While the above has been indicated, for simplicity, in the separated domains, in actual practice, all three domains form an interactive interplay in the learning situation, so that the designing of a learning plan (using objectives drawn from a classification such as Gagné's or any

other) has to incorporate the 'compounding' of the three domains in each learning event. This may be visualized in the graphic representation below:

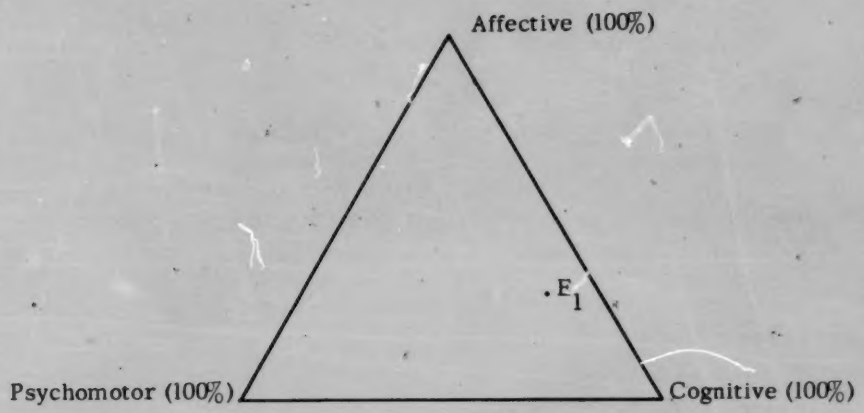


Figure 3. Co-ordinates of Learning Event

Thus a particular event E_1 will be defined through simultaneous co-ordinates in the three domains.

Conclusion

For designing a learning system it is essential to state the learning objectives in performance forms, indicating the range of conditions under which the individual is expected to perform and the standard or level of acceptable performance. To write educationally meaningful behavioural objectives, task analysis must be considered as a complementary activity and a very important source for the writing of behavioural objectives. The objectives, however, must be kept free of 'trivialities'.

Chapter Five

METHODS OF TASK ANALYSIS

Many management techniques may be adapted for use as methods of task analysis, to identify and provide alternative solutions to educational problems. Some of the methods that have already been used successfully are: (1) Systems thinking; (2) Coral patterning; (3) Network analysis; and (4) Algorithms.

1. Systems thinking. The basis of the technique is that everything can be visualized as:

a) A system in itself.
b) Part of a larger system.
c) Containing within it sub-systems.

A systems diagram is drawn to show the boundaries of the system under investigation, and the position of all the sub-systems and related systems. Once the diagram is completed, it is possible to identify the actions, interactions, dependencies, and feedback between systems and sub-systems. This provides an opportunity to analyse the system to identify whether it is achieving its objectives, where faults are occuring, and where new links may be tried out. For example, a teacher giving a lesson may be represented in a diagram as:

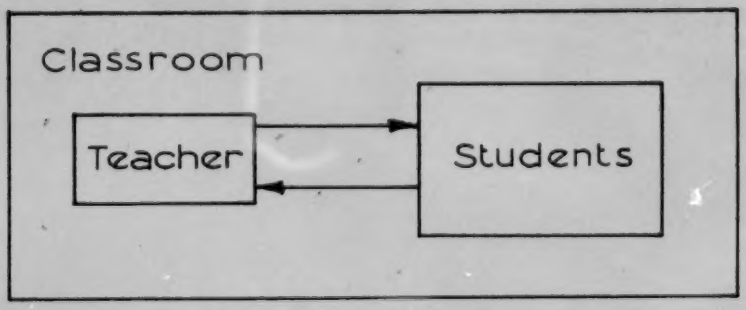


Figure 4. The classroom system

This shows the teacher inter-acting with his or her students. It may raise questions such as:

- Where could resources be introduced?
- How can a meaningful feedback to the teacher be incorporated?

2. 'Coral' patterning. This is a useful method of note-taking and thinking out a problem because it can cope easily with random thoughts. The subject is noted in a box drawn in the centre of a sheet of paper. Single titled lines then radiate from the box. The lines or thoughts generally "spark off" other thoughts and ideas. Related ideas may be linked by dotted lines, other related coral patterns may also be shown as dotted boxes. The method is also useful for outlining and designing reports.

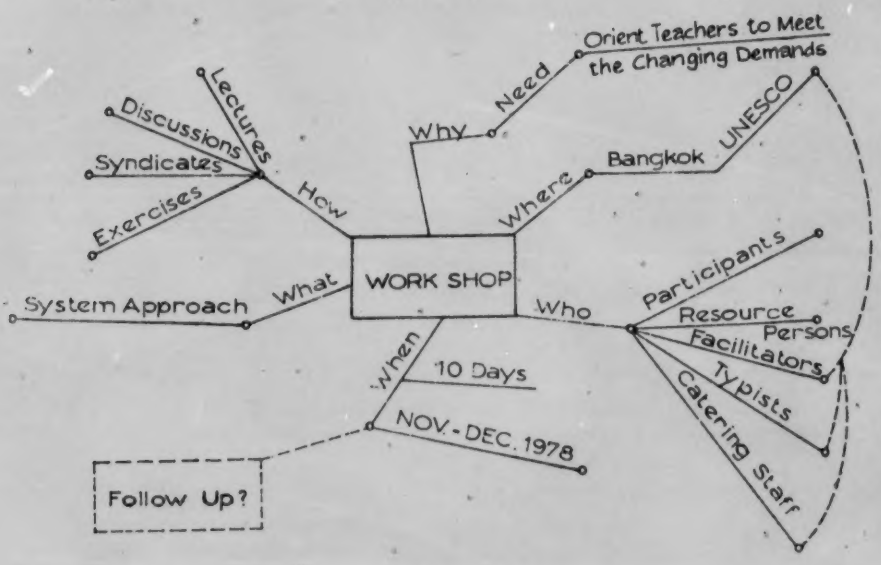


Figure 5. Coral patterning

3. Network analysis. This method was developed for the Space Project of the United States of America. It is adaptable for any educational project where planning, scheduling and controlling are important factors. First, all the activities that are to be carried out are detalled (the coral pattern could be used as a beginning).

Second, the activities are drawn in the form of an arrow diagram, based on two vital questions of each activity:

a) What is the earliest date when the activity could start?
b) What is the latest time by which it must be finished?

this is shown in a simple example of "organizing a course"

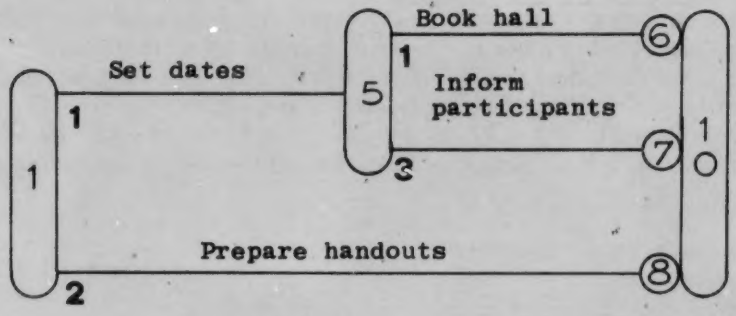


Figure 6. Network analysis

The numbers inside the circles or 'sausages' are only used for identifying activities numerically. The times may be added for the activities - the bold numbers underneath the line to the extreme left (in this instance - weeks).

Third, it is possible to identify the critical path, i. e. those activities which must start and finish according to time.

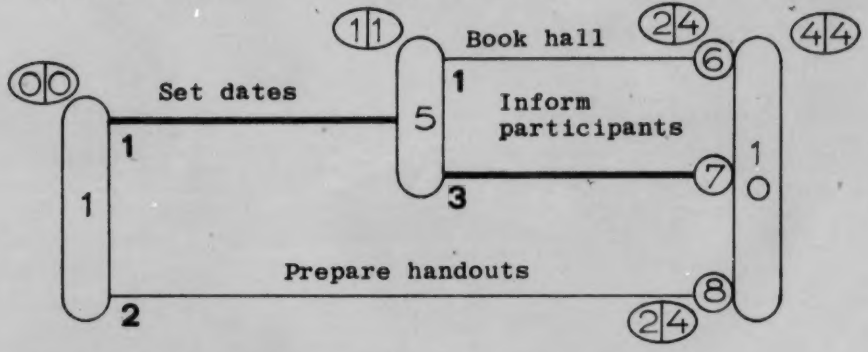


Figure 7. Critical paths

The heavy line shows the critical path. The other activities have a certain amount of float-time.

4. Algorithms. These are frequently known as decision trees - sometimes unkindly called "Idiot's Guides," because little intelligence is required to follow the chart and arrive at a decision.

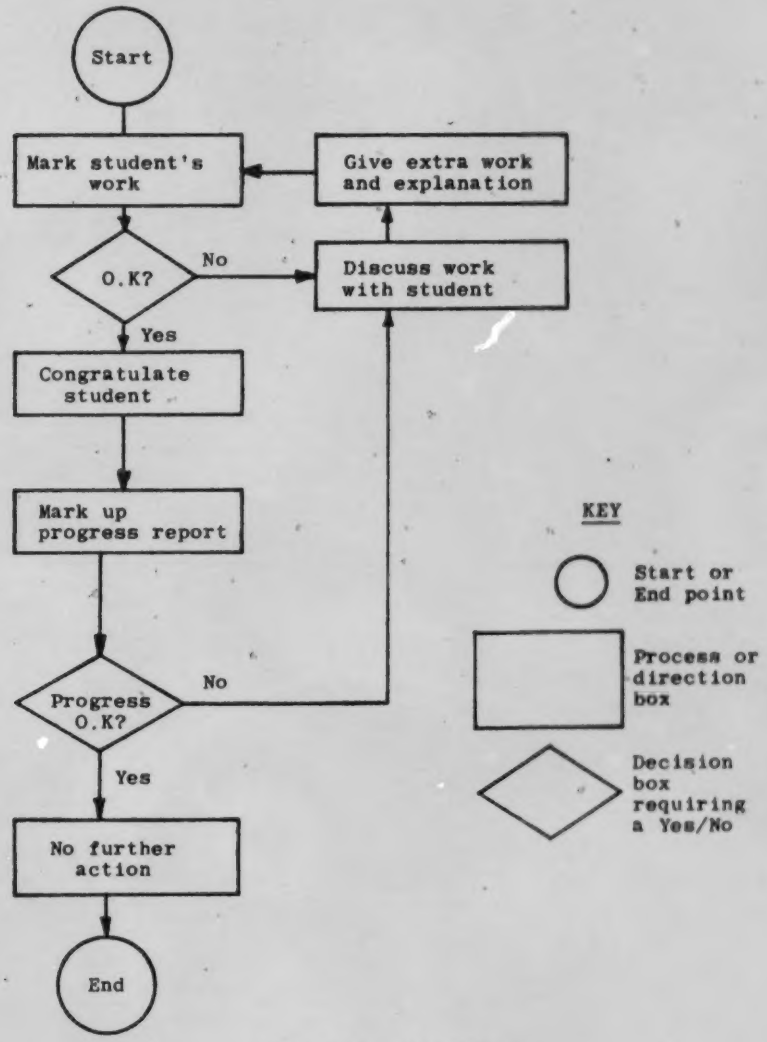


Figure 8. Algorithms

Note: The examples shown (1, 2, 3 and 4) are just a few of the approximately 150 management techniques that can be used to solve educational problems.

OTHER MANAGEMENT TECHNIQUES
(Classified by Objectives)

A. Detection

1. Input-output analysis
2. Attitude survey
3. Production study
4. Brainstorming
5. Checklist
6. Activity sampling
7. Dynamic evaluation
8. Marginal costing
9. Critical examination
10. Interfirm comparisons
11. Company appraisal
12. Market research
13. Behavioural science
14. System charting
15. Breakeven analysis
16. Sensitivity analysis

B. Evaluation

1. Managerial grids
2. Capital project evaluation
3. Paired comparisons
4. Ranking and rating
5. Productivity measurement
6. Job evaluation
7. Work measurement
8. Work estimation
9. Performance analysis
10. Merit rating
11. Performance-cost indices
12. Management ratios
13. Risk analysis
14. Venture analysis
15. Cost-benefit analysis

C. Improvement

1. Management by objectives
2. Motion study
3. Procedure study
4. Work simplification
5. Internal auditing
6. Value analysis
7. Standardization
8. Method study
9. Variety reduction
10. Fatigue study

D. Optimization

1. Contouring
2. Replacement theory
3. Linear programming
4. Dynamic programming
5. Queueing theory
6. Symbolic logic
7. Evolutionary operation
8. Monte carlo technique
9. Game theory
10. Simulation
11. Decision theory
12. Sequencing
13. Ergonomics
14. Search theory
15. Inventory models
16. Routing and location studies

E. Specification

1. Planning, general
2. Strategic planning
3. Organization study
4. Office and plant layout
5. Profit planning
6. Labour utilization
7. Planned maintenance
8. Network analysis
9. Classification and coding
10. Information retrieval
11. Form design
12. Production planning

F. Control

1. Cash control
2. Credit control
3. Labour control
4. Inventory and stores control
5. Quality control
6. Production control
7. Standard costing and budgetary control
8. Scrap control
9. Cybernetics
10. Damage control and disaster control

G. Communications

1. Interviewing and consultation
2. Operational gaming
3. Incentive schemes
4. Visual aids
5. Suggestion schemes
6. Report writing
7. Productivity bargaining
8. Communication theory
9. Information theory

J. Demonstration

1. Programmed learning
2. Management development
3. Job instruction
4. Training

Chapter Six

EVALUATION AND ITS ROLE IN SYSTEMS ANALYSIS

The nature and function of evaluation

The concept of evaluation in any context implies a checking or assessment of what goes on. This is done so that the actual facts of a situation may be ascertained and remedial action taken where necessary. When techniques of system approach are being used, evaluation assumes an even greater significance. It becomes a very positive and necessary condition for the movement of the total system towards achieving its objectives. If specific objectives have been identified and formulated in appropriate form, alternative strategies considered, and a strategy that best meets the need–in the context of resources and constraints–selected, in the next step of designing a detailed plan of operations the availability of evaluation becomes a necessary condition not just for evaluating the plan but for assessing the objectives and the strategy selected. This results from the fact that any type of systems approach is by nature analytical in that the various components and their interactions must be defined as clearly as possible. Since a detailed analysis helps to isolate the factors which may contribute to the malfunctioning of the whole system, evaluation can perform a vital diagnostic role by suggesting corrective action at every stage of operation, instead of having the system with all its errors proceed blindly to its final end. Evaluation used specifically for this purpose of correcting an ongoing process, rather than only for final product assessment, is one of the most important contributions of systems thinking to programmes in education. Formative or continuous evaluation, (providing feedback which enables adjustment of the programme to meet intermediate objectives), results in a better chance for the programme to achieve its final objectives. In this way, systems analysis helps designers not only to evaluate a final product but also to recognize problems, and improve the process, as the system moves along.

As a first step in evaluation, in the context of a total system, it is necessary to identify the dependent or sub-systems in terms of their inputs, processes, outputs and their functional relationships. This first function of evaluation is descriptive, in that data will be gathered on as many aspects as possible in order to establish a clear picture of the system and its functioning. The data available are thereafter considered and weighed against the predetermined criteria, decided upon already as

evidence of achievement of the objectives. If the result is deemed satisfactory, the process continues on to the next step. If the data available give definite indications that the criteria already set have not been met, there is a need to remedy the situation, possibly by going back to repeat the preceding step over again or designing a new 'preceding step' and going through this. The judgement function of decision-making, whether to proceed or to correct the error, depends for its accuracy on the suitability of the accepted criteria.

General criteria for assessing achievement

In any system, a number of general criteria may be identified as indicative of achievement of its broad goals, before going into an analysis of its specific objectives and their achievement.

Effort - This comprises all supportive activities that must work in unison in order that the main activity may be successfully completed. For instance, in designing in-service education programmes, selection of locations, housing and food–and costing–are some of the supportive activities that must be undertaken before or concurrently with providing the academic experience to the participants. Constant evaluation, feedback, and corrective action on these aspects are necessary in order to realize the most gain from the total effort.

Effectiveness - This signifies the long-term effect a programme is expected to have on the target population. For instance, in the case of in-service education, if effectiveness of a programme is ensured, it will result in teachers performing their functions with the learners better than they had previously. In order to evaluate this aspect, specific criteria of success need to be worked out. Such criteria are generally defined in one of the following ways: evidence of (a) impact on a target population; (b) impact on a target versus non-target population; and (c) performance to some pre-determined standard.

In an in-service education programme, one may administer a pre- and post-test. This will show the gain resulting from the new experiences, but it will not indicate that the gain was due to the effectiveness of the programme per se. Comparative gains over the same period by two groups - target and non-target - may result in a better indication, but this process is not easy, as the two groups have to be matched for all variables except the one being evaluated. The third alternative is to establish well-defined objectives and corresponding performance criteria. Success here is defined as a target population's ability to obtain a certain level of knowledge, skills and attitudes, and to maintain such standards over a period of time.

In addition to these two general criteria, Efficiency is considered a major criterion in looking at possible alternative strategies for achieving the same objectives. More than one alternative may be considered in terms of the relative costs, or the time involved. Efficiency in terms of one organization or local setting may mean some change to be achieved in a very short time, while for another the quality of the change may be the crucial and deciding factor. An in-service education programme that takes place after a radical curriculum change, for example, may sometimes be judged for efficiency by its ability to cover the whole target population of teachers in a given time, rather than to give all the competencies to a limited number of teachers.

In-service education in the context of educational goals

The final aim of in-service education of teachers is the achievement of long-term educational goals of a country, through the realization of positive pupil behaviours, which hopefully will remain during the total lifetime of the pupils. These goals however are dependent on many factors, only one of which is the school learning programme. The learning programme of the school is itself dependent again upon many factors, a major one being teacher effectiveness. In order that a teacher may be effective, one contributory factor is the set of teacher competencies. These may be achieved through different means, one of which is effective in-service education of teachers. It is thus seen that successful teacher in-service education programmes are a necessary condition for achieving expected pupil outcomes. It has to be recognized, however, that such programmes cannot in themselves produce the hoped-for pupil behaviours unless all other conditions are present.

Evaluation of in-service education programmes

1. General guidelines

Before implementation can take place, say for an in-service education programme, a number of actions are required to determine such data as the number of teachers in a particular area and their entry behaviours, the facilities available at a particular centre at which the in-service action is to take place and the number of facilitators of defined competence that will be required. These items of data may collectively be called status data, and preliminary 'evaluation' of the status is a requirement for the systematic implementation of an in-service action. Since this status evaluation is done at the formative stage of the operation and could have its effect on the design aspects at this stage, it may be considered a component of the formative evaluation. In addition, at the formative stage, evaluations may also be done of, say, new methodologies that may be adopted during the operation, or new equipment. This would be a 'beyond-status' formative evaluation.

So, in the development of a generalized plan for evaluation, the following items may be included:

	Modes of evaluation	
	Formative	
	Status	Beyond-status
Implementation of plans		

Once implementation begins, the operation has to be monitored and summatively evaluated. Hence the plan may be extended to include these three important components of evaluation: formative, monitoring and summative evaluation.

Unit operations	Modes of evaluation			
	Formative		Monitoring (Continuous)	Summative (Terminal)
	Status	Beyond status		
Implementation of plans				

Prior to implementation, planning needs to be done, and the plans communicated to those who implement. Each of these operations, too, have to be evaluated in a way similar to what was considered for implementation. So the general evaluation plan may be extended to include the following:

Unit operations	Modes of evaluation			
	Formative		Monitoring (Continuous)	Summative (Terminal)
	Status	Beyond status		
Planning Communication of plans Implementation of plans				

In fact, the total set of Unit operations would include: (a) Planning; (b) Communication of plans; (c) Implementation of plans; (d) Monitoring and supervision of implementation; (e) Maintenance of implementation; (f) Evaluation of implementation; and (g) Feedback to further planning.

Each of these unit operations has to be evaluated in the manner indicated earlier for the implementation operation. Even the monitoring and the evaluations have to be evaluated. Thus the general plan for evaluation may be completed as follows:

Unit operations	Modes of evaluation			
	Formative		Monitoring (Continuous)	Summative (Terminal)
	Status	Beyond status		
Planning Communication of plans Implementation of plans Monitoring and supervision of implementation Feedback to further planning				

Figure 9: General evaluation form

A further elaboration in the generalized evaluation plan may be made. Operations for a national programme generally take place at various levels, either of hierarchy or geographical disposition, or both. For example, when a policy decision is made regarding conducting in-service education programmes in a country, macro planning takes place at the national decision-making level, to be implemented at the next level in the hierarchy, and these plans are communicated to the level which implements it and conducts the other unit operations. Implementation at this second level may involve planning for operations at the next lower level, communicating these plans to this third level and so on.

Hence the general plan may be used either at the macro level or at any of the sub-macro levels, as the total programme would demand.

Finally even within each of the unit operations the general plan for evaluation may be applied. Taking the unit operation of communication as an example, the communication operation has to be as follows:

a) The operation has to be planned;

b) These plans for communication have to be communicated; to those who will implement the communication;

c) The communication action has to be implemented;

d) The implemented communication action has to be monitored and supervised;

e) The implemented communication action has to be maintained;

f) This implementation of the communication has to be evaluated; and

g) The feedback regarding the implementation of the communication has to be fed back to the re-planning of the communication.

For each of the above actions the general evaluation plan will apply.

Having developed a general plan for evaluation, it may well be impossible for all the evaluative actions implied in all the cells in the generalized plan to be conducted, due to the realities of constraints in the real-life situations in Member States. If, however, any cell is omitted, it may be done with due recognition of the loss to the programme.

2. 'Mile posts' in evaluation

In planning evaluation designs, it is often necessary to identify 'mile posts' or 'enabling objectives' that have to be reached on the way to reaching the final objective. If, for example, the 'inquiry-based classroom' is the final objective of the educational reform, and at present teachers are essentially adopting the 'telling' method, a sequence such as the following may be considered indicating 'milestones' on the way to reaching the final objective:

> Teacher telling (1) teacher asking questions that are only factual recall (2) teacher asking questions that are more than factual recall (3) teacher posing questions regarding a particular problem situation (4) teacher initiating questions regarding a particular problem situation and asking learners as to what further questions may be asked to clarify the problem (5) teacher repeating problem initiation and extension for group work (6) teacher posing problem and eliciting questions from learners to clarify the problem in large and small group work (7) teacher eliciting problem situations from learners (8) 'enquiry-based classroom.'

Tactically there are at least two major advantages in developing 'milestones'. As implementation proceeds, the direction of deflection towards the final objective may be plotted and if skewing is taking place, corrective actions may be taken early in the initiation. Secondly, the psychological break from mental set from milestone, say, (2) to (3) is fundamental and considerable efforts may be focussed upon such identified critical points.

Such 'milestones' may be identified for any of the operations in a programme, even if the theory concerning such actions may not be available, for the wisdom of field practitioners may well be a valid source of expertise for such analyses.

3. Special considerations at micro-level operation

All in-service education programmes at the micro level comprise two components - the purely academic or instructional and the management or organizational aspects. The academic component is built into the system by following the four steps of:

a) specifying desired outcomes (objectives);

b) specifying competencies indicative of the realization of each outcome (criteria);

c) taking action in order to achieve the outcomes (programme of action); and

d) evaluating whether the outcomes have been achieved.

At each of the steps (a) to (c), formative evaluation needs to be undertaken in order to ensure that the system is moving in the defined direction, while the final evaluation in (d) takes the form of summative evaluation of the programmes.

Special attention to evaluation and corrective action have to be taken at (c), which is the crucial stage at which many activities take place. It has to be borne in mind that any instructional activity depends upon the interaction of a number of variables such as:

a) the desired outcome;
b) the characteristics of the learner;
c) the characteristics of the instructional setting;
d) the nature of the instructional activity (content presented and strategy used).

Evaluation at (c), has to pay particular attention to these four aspects which, in themselves, have many characteristics that may affect the final performance.

The management component on the other hand does not necessarily bear a secondary role, as its main task is to provide the supportive services necessary to ensure the achievement of the objectives. Such supportive services may be provision of plant and facilities, administrative measures to facilitate programme execution, selection of personnel and costing. Thus it is mainly dependent on the designed programme, sensitive to all conditions influencing its operation and products, and should be capable of taking adaptive-corrective measures.

On the results of periodic evaluation the management component may take action in one of three ways.

a) proceed to the next step (if the evaluation shows positive results);

b) bypass the next step and go to a step further on (if it is deemed appropriate); or

c) take corrective action by

i. modifying or repeating previous action;
ii. modifying subsequent planned action; or
iii. abandoning the action chain.

4. Methods of evaluation

In the formative stage, when evaluation is undertaken as an on-going process and the programme of in-service education is still under-way, in micro situations, the following are some of the methods that have been used effectively in Member States:

- observation and recording;
- rating scales;
- informal discussion;
- questionnaires;
- pre- and post-tests;
- simulation and try-out sessions.

At the summative stage, the effect of in-service education programmes may be felt in both teacher and pupil behaviour. However, as these two outcomes may have been influenced by a number of factors extraneous to in-service education, the 'inefficiency' of the in-service education programme may not be the one reason for non-achievement of expected objectives. With this provison in mind, summative measures of evaluation of an in-service education programme have commonly taken two forms in Member States:

- direct evaluation may be undertaken to assess the maintenance of teacher competence identified through methods given above, through self-evaluation by teachers and surveys.

- in addition, indirect evaluation of the long-term effects of a programme may be undertaken by assessing the final output of desired pupil outcomes which may use any of the above methods, as well as formal testing or continuous assessment.

Conclusion

Evaluation is a major technique in the application of systems thinking. It is necessary that at every stage of analysis of data, feedback and corrective measures be undertaken. In this context evaluation performs two major functions, the first being a descriptive one - in the collection and analysis of data - and the second taking a judgement role in making the decisions based on the description.

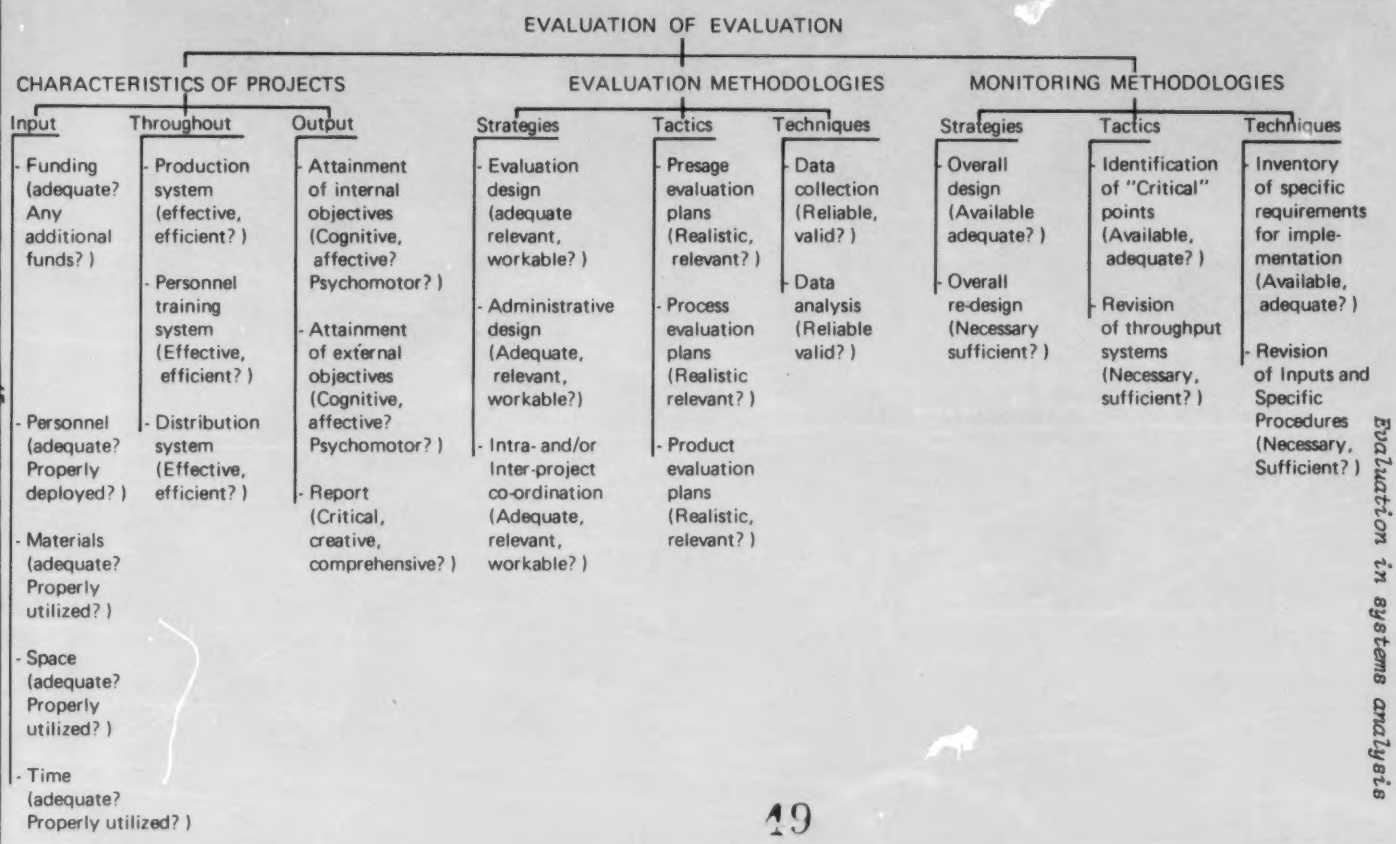
Using these functions, evaluation may be undertaken to assess the performance of a system in terms of three criteria - those of effort, effectiveness and efficiency. However, when in-service education programmes are being evaluated, especially on a long-term basis, there is a need to remember that the final goal of teacher effectiveness may be a function of many factors, of which in-service education is an important one.

General guidelines for evaluation of in-service education programmes may include modes involving 'status' and 'Beyond-status' aspects in the formative stage; a continuous mode in the monitoring stage and a terminal mode in the summative stage appropriate in performing various functions before, during or after implementation. Such a framework, together with a suitable check-list of types of critical questions may be used very effectively in evaluating programmes specially at the macro level. Another factor to be considered in such evaluation is the identification of milestone events which can help in developing intermediate objectives. At the micro-level, any in-service education programme is composed of a major academic component, supported by a management or organizational component. Both these components need to be monitored continuously and evaluated for possible corrective action.

Methods of evaluation are many and varied, and should be selected on the basis of the stage at which they are to be used, either while the programme is being implemented (formative) or at the conclusion of the programme (summative). Depending on these stages, again, such evaluation may be undertaken in terms of the performance of different groups of personnel, those responsible for administration, participating teachers, or pupils whose change of behaviour is the final objective of the programmes.

In addition to the above, the following check-list of types of critical questions to be asked in the evaluation operations may have practical value: (see Figure 10)

Figure 10. Check-list for evaluation


EVALUATION OF EVALUATION
CHARACTERISTICS OF PROJECTS
Input
- Funding (adequate? Any additional funds?)
- Personnel (adequate? Properly deployed?)
- Materials (adequate? Properly utilized?)
- Space (adequate? Properly utilized?)
- Time (adequate? Properly utilized?)
Throughout
- Production system (effective, efficient?)
- Personnel training system (Effective, efficient?)
- Distribution system (Effective, efficient?)
Output
- Attainment of internal objectives (Cognitive, affective? Psychomotor?)
- Attainment of external objectives (Cognitive, affective? Psychomotor?)
- Report (Critical, creative, comprehensive?)
EVALUATION METHODOLOGIES
Strategies
- Evaluation design (adequate relevant, workable?)
- Administrative design (Adequate, relevant, workable?)
- Intra- and/or Inter-project co-ordination (Adequate, relevant, workable?)
Tactics
- Presage evaluation plans (Realistic, relevant?)
- Process evaluation plans (Realistic relevant?)
- Product evaluation plans (Realistic, relevant?)
Techniques
- Data collection (Reliable, valid?)
- Data analysis (Reliable valid?)
MONITORING METHODOLOGIES
Strategies
- Overall design (Available adequate?)
- Overall re-design (Necessary sufficient?)
Tactics
- Identification of "Critical" points (Available, adequate?)
- Revision of throughput systems (Necessary, sufficient?)
Techniques
- Inventory of specific requirements for implementation (Available, adequate?)
- Revision of Inputs and Specific Procedures (Necessary, Sufficient?)

Chapter Seven

THE SYNDICATE TASKS

Reports of three syndicate tasks which were designed to achieve some of the objectives of the Workshop are enclosed in the following pages. Active involvement in each task enabled the participants to develop mainly through peer learning, a range of skills and abilities in detailing with in-service training programmes in a systematic manner.

The format varied from task to task but, as the tasks were based upon the assignments received from the participants, in that respect they were true to life. To facilitate the working of the syndicates, a note on syndicate work was given for general guidance of the participants and facilitators (see Appendix 1).

Report of syndicate task I

Members of the Workshop divided themselves into three syndicates, and each syndicate considered the following:

Theme of the task: Problem identification and specification of objectives.

Rationale: In designing a learning system, its success will depend upon: analysis of a situation, identification of major problems and issues, and specification of objectives. The critical point in understanding or using a systems approach rests on the importance of clearly stating the objectives.

Curriculum change and innovation are desirable in many systems of education. A change in curriculum however, brings other problems and issues which have to be resolved before success can be achieved. In-service education of teachers is only one of the problems associated with curriculum change. Using a systems approach is useful in identifying and solving such problems.

Objectives: On completion of the task the syndicate will be able to:

1. Identify problems arising out of curriculum change:

   a) Identify the factors associated with a curriculum change.

b) Identify and list the major problems associated with a curriculum change.

c) Identify the problems related to teacher competency in the context of curriculum change.

2. Write objectives for in service teacher education falling into different domains in the context of curriculum change.

a) Categorize objectives of in-service teacher education in three domains.

b) Write a few major objectives falling into each of the domains in the context of curriculum change.

c) Develop plans for such work in the context of curriculum change in the first level of education.

3. Write a report on the discussion and make recommendations regarding objectives.

a) Write a report on discussion.
b) Propose an action plan.

Broad aims of in-service education programmes

In preparation for the Syndicate Task I, the chairmen and women of the syndicates developed the following broad aims and objectives, and defined the expected broad entry behaviours of the target populations:

Teachers at the first level of education may be categorized under three broad headings for planning the in-service programmes.

(a) teachers trained prior to introduction of the new curriculum; (b) untrained teachers; and (c) partially trained teachers. Towards developing broad goals, the following rationale may be utilized:

- The relationship between education and work has received a new perspective.
- There is a greater emphasis in developing countries to relate education to life, needs, and aspirations of the individual and to the fulfilment of national objectives.
- Teaching should be done by utilizing the available resources in the community.
- There is a reduced emphasis on discipline/subject-based designs in first level curricula.
- There is a recognition of the need to provide for a minimum learning package at the first level, achievable by all learners.

Using the rationale, the following broad goals may be identified (for the trained teacher population).

After the in-service training action, the teacher should develop competencies in the cognitive, psychomotor and affective domains in:

a) Teaching the new curriculum (content and methods);

b) Analysing and relating contrived learning situations to real-life situations;

c) Encouraging pupils to participate in self-learning, discovery learning, peer learning, and promotion of creative thinking;

d) Involving the community in school programmes, and the school in community activities;

e) Teaching the new curriculum using the immediate environment;

f) Engaging children in socially useful productive work as a component of general education;

g) Implementing the teaching methodologies and evaluation procedures as implied in the rationale;

h) Recognizing the individual needs of children and guiding them to fulfil their needs, with specific reference to the deprived children or children coming from the weaker sections of the community;

i) Utilizing formal, informal and varieties of hybrid modalities relevant to the various learning situations; and

j) Developing the skills for conducting investigations to solve problems arising out of the immediate teaching/learning situations.

For the untrained and partially trained teachers, all of the above competencies apply. The relative weightage, such as educational psychology or methods of teaching, would have to be determined as specific objectives.

Identification of problems

The approach to Task 1 was an experiential model in all syndicates, from which the following steps were developed:

a) Establish boundary of problem systems;
b) Identify sub-systems,
c) Identify the factors in each sub-system;

d) Establish the major constraints;
e) Break down the major constraints into sub-constraints;
f) Identify the major problems associated with:

- curriculum change;
- teacher competency.

g) Formulate major objectives;
h) Formulate specific objectives.

Following each of the steps indicated above, as a preliminary exercise, the system under consideration was sub-divided into significant sub-systems or components, their various interactions considered, and, under each, a first identification of problems was made, such as in the check-list below: (The significant components are underlined).

1. Aims and priorities

a) Check curriculum against aims and priorities;
b) Likelihood of achieving these in terms of

- Students, teachers and community;
- Available resources.

c) Rationale based on applicable educational theories;
d) Time schedule;
e) Breakdown in objectives; and
f) Clarity.

2. Student/teacher

a) Learn new competencies in terms of content and method;
b) Attitudes;
c) Motivation;
d) Awareness of need for change in terms of philosophy;
e) Instructional materials;
f) Places available for pre-service and certification;
g) Types of courses (full-time, part time etc.);
h) Discrepancy of entry behaviour; and
i) Socio-economic status.

3. Management

a) Curriculum details printed;
b) New forms;
c) Back-up support (financial, professional and moral);
d) Recruitment and selection procedure (selection, interview and appointment);
e) Enrolment; and
f) Training method and style.

4. Time table

   a) Re-arrangement;
   b) Availability of rooms, teachers, transport, facilities; and
   c) Duration of the course.

5. Curriculum

   a) Need for adjustment/revision;
   b) Check against aims and priorities; and
   c) Analysis of lesson plans.

6. Teacher-educators

   a) Classification;
   b) Up-grading;
   c) New appointments;
   d) Re-training of familiarization course;
   e) New competencies in terms of identification and training;
   f) Attitude;
   g) Motivation;
   h) Awareness of need for change - philosophy;
   i) Supporting materials for teachers including textbooks; guides for teachers and the like;
   j) Number required (staff);
   k) In-service training courses - refresher/certification; and
   l) Resistance to change.

7. Learning aids

   a) Identification of aids;
   b) Development
   c) Design;
   d) Production of aids by student teachers of commercial agencies or others;
   e) Variety of aids;
   f) Distribution;
   g) Evaluation;
   h) Storage;
   i) Hard and soft ware.

8. Facilities

   a) Appropriateness;
   b) Adaptation/alteration;
   c) Maintenance;
   d) Extension; and
   e) Availability.

9. Technology

   a) Appropriateness;
   b) Expansion;
   c) Sources; and
   d) Cost effectiveness.

10. Quality control

   a) Examinations - new types;
   b) Entry test - definition of entry behaviour;
   c) Performance test;
   d) Revision of existing methods; and
   e) Improvement of instructional materials.

11. Research

   a) Keeping a log-book on the changes being effected;
   b) Evaluation of changes; and
   c) Follow-up of activities of teachers.

12. Costs

   a) Availability of budget;
   b) Financial procedure;
   c) Budgetary control;
   d) Sources of funds available;
   e) Allocation of funds;
   f) Financial planning; and
   g) Financial constraint.

13. Service to community

   a) Identification of needs of community;
   b) Awareness and distribution of information; and
   d) Evaluation of the impact of change on children.

Flow charts such as the following were developed to focus on coping with change, with the recognition that each stage in the process should be taken with reference to the factors indicated.

Associated with the changes in curricula, specific changes are expected in a number of elements in the learning/teaching situation, such as those below and on page 52.

	From		To
Teacher's role	a) Knowledge transferer	-	Problem solver/innovator/ change agent

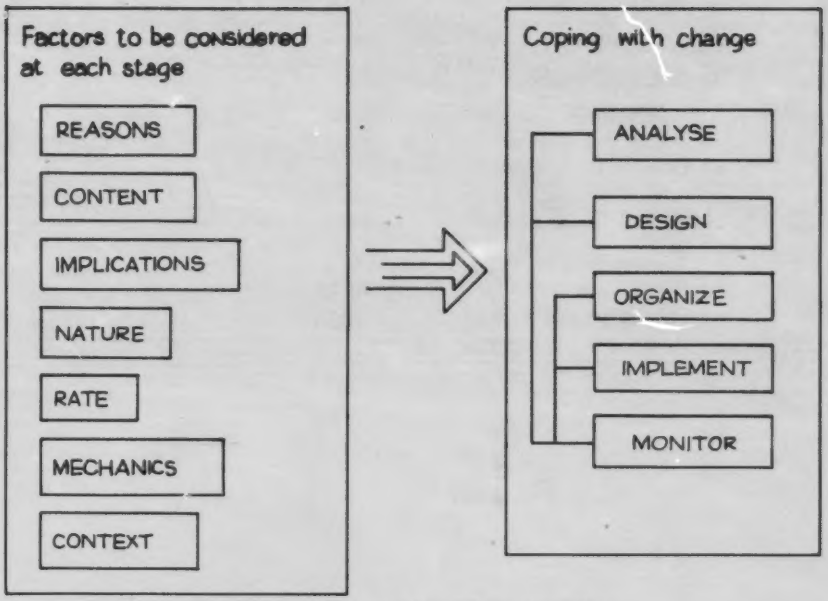


Figure 11. Coping with change

	From	To
	b) Authoritarian behaviour	- Facilitator of learning
	c) School-centred	- Community-oriented
Content and approach	a) Subject-discipline content	- Integrated content
	b) Old teacher telling approaches	- New activity based approaches (i.e. Math/Science/ Social Studies)
	c) Content-centred	- Work experience incorporated
Methodology	a) Teacher-centred	- Active learning-centred
	b) Rote learning	- Problem solving/understanding
	c) Talk-and-chalk	- Learner activity
	d) Demonstration	- Practice
Materials	a) Textbooks alone	- Workbooks and other materials
	b) No aids	- Learning-material kits
	c) No improvization	- Use of locally available materials

Evaluation	a) Traditional examination (pass/fail)	- Continuous assessment and remedial measures
	b) Repetition	- Automatic progression
	c) Marks	- Comments

Having analysed in detail the variety of problems as they arise from curriculum changes themselves, from constraints in the implementation of new curricula, and from the constraints of management including human, material, time, space and financial resources, the Syndicates made a list of major problem types of significance in designing and implementing in-service education programmes. The list included below is not exhaustive, but is indicative of types of problems that the Syndicates identified and analysed.

SOME MAJOR PROBLEM TYPES

Substantive aspects

1. In-service actions for teachers

   a) Establishing motivation and self confidence to attend in-service actions and apply learned facts in field situations.

   b) Sampling of the new curriculum content/methodologies/techniques for in-service actions at various geographical levels of delivery, in the context of time, space, material, human and financial constraints.

   c) Identifying the competencies implicit in this sampling of new curriculum content/methodologies/techniques, including competencies for using formal/informal hybrid modes, and peer and inter-learning; operating with 'disadvantaged' learner populations; utilization of community resources; intervention in the community for enhancement of the quality of life; and for acting as a facilitator of active learning and change agent in the community.

   d) Defining the extent of proficiency to be attained in these competencies in the context of constraints in time, space, materials, personnel and finance.

   e) Designing and executing activity-based learning episodes (including use of relevant learning materials - hard and soft ware) capable of generating these competencies in in-service actions to the defined level of proficiency.

f) Identifying the competencies required for the transfer of sampled competencies to the generation of competencies required for other content/methodologies/techniques in the curriculum not taken up in in-service, (such as resources from nation building departments) as required by content and activity areas not covered in the in-service actions, and especially those requiring adaptation of curricula to local situations.

g) Designing and producing support materials (including hard and soft ware) for sustaining and extending the sampled competencies acquired in in-service actions, and for generating new competencies required for the total curriculum change.

2. In-service actions for trainers

a) Establishing motivation to attend in-service actions and apply learned facts in a field situation.

b) Identifying competencies required in trainers to train the trainees in aspects indicated above.

c) Defining the extent of proficiency required in these competencies.

d) Designing and executing activity-based learning episodes (including use of relevant learning materials - hard and soft ware) capable of generating these competencies in in-service actions.

e) Designing and producing support materials as in 1 (g) above.

3. In-service actions for other personnel (headmasters, supervisors, advisers)

a) Establishing motivation to attend in-service actions and apply learned facts in a field situation.

b) Identifying competencies required to support (including assistance in co-ordinating with nation building department officials at the local level), monitor, guide, evaluate the performance of teachers in field implementation, and provide feedback.

c) Defining the extent of proficiency required in these competencies.

d) Designing and executing learning episodes (including use of learning materials - hard and soft ware) in in-service actions capable of generating these competencies to the extent defined.

e) Designing and producing support materials as in 1 (g) above.

4. Organizational aspects

a) Specifying the strategies and modalities for the delivery of in-service actions to defined numbers of teacher trainees, and other personnel, at various geographical levels.

b) Establishing motivation in the management system for effective implementation of new curricula in the field.

c) Making available and deploying for the purpose financial, time, space, material, and human resources, in adequate quantity, in required quality, and at designated times for:

(1) Planning and designing of in-service and continuing-education actions; and
(2) Implementation, monitoring and quality-control, evaluation, providing feedback to planning and designing, and replanning and redesigning of these actions.

5. Support communication to community aspects

a) Establishing communication flows regarding new curricula to and from the community (parents and opinion leaders), to elicit support for the changes in the education system and the function of in-service actions to implement these changes.

b) Establishing communication flows through in-service actions to reinforce the above support-communication, including use of community members and resources for in-service actions.

Priority objectives for in-service education related to curriculum change

Based upon the general objectives and the systematic identification of problems, the Syndicates proceeded to define priority objectives for in-service action. The major focus of the thinking was on the sub-macro-level activities but it was recognized that, for these activities to proceed, prior planning has to be assumed at the macro- or decision-making level.

Before the initiation of a programme of in-service education, at the macro level, planning actions have to be taken which will specify a number of inputs to action at lower levels, such as policy decisions in regard to strategies, modalities, target populations to be reached, resources that will be available and management services that will be provided, based upon which, sub-macro level planning may take place.

At the end of the macro planning sessions, the sub-macro planners should receive unambiguous communications containing:

- specified general strategies and modalities;
- specified numbers of teacher trainees, and other personnel to be reached in a specified time span at various geographical level;
- specified frequency of in-service actions in that time span;
- specified designs for monitoring for macro purposes;
- specified designs for evaluating and providing feedback for macro purposes;
- specified personnel and locations to be utilized for the programme;
- specified directions that have been issued to the macro management system (including the non-Education Ministry/ Department) to motivate it and support the programme;
- specified amounts of financial resources at specified times, for specified purposes, being made available to the programme.

The specifications of the above communications will cover all aspects of the programme at the sub-macro level:

- pre-planning investigatory activities to support sub-macro action;
- planning and designing sub-macro actions;
- communicating the plans (to those who will execute at the micro-level);
- implementing the programme at the sub-macro level;
- quality control and monitoring the programme at the sub-macro level;
- evaluating the programme and providing feedback at the sub-macro level.

It is also assumed that, together with the communications listed above, macro-level officials will initiate actions which will generate the activities indicated in the communications.

In specifying the objectives for in-service action at the trainee level, the Syndicates recognized that not all the defined objectives

given below may necessarily be achieved in single in-service session. The designed programme of in-service education should however attempt to achieve all of these objectives over its several sessions.

The list has not been placed in hierarchical order because it is recognized that several hierarchies are possible, and the particular position of a given objective in a hierarchy will depend upon the particular context of the in-service session, even within a given country. It was also recognized that some of the objectives, such as those dealing with critical thinking, continuous learning, problem solving, use of the local environment, may be interpolated into designs intended to achieve other objectives.

At the end of the in-service education programme, the trainees will be able to:

- Identify the changes implied in the new curriculum such as principles, objectives, structure, methodologies, content;
- Identify new roles they will have to play;
- Justify the changes implied in the curriculum;
- Justify the new roles they will have to play;
- Teach new content areas of the curriculum;
- Use new techniques/methodologies in providing learning experiences in the areas of curriculum covered in the in-service action, and transfer these to other areas of the curriculum;
- Select appropriate techniques/methodologies (such as criterion reference testing of learning outcomes, mastery learning, enquiry methodologies, formal/informal hybrid modes, peer and inter-learning) for providing learning experiences in the changed curriculum;
- Develop learning experiences related to the curriculum using inexpensive local material, local environment and appropriate soft ware;
- Adapt the curriculum to local environment, making the learning experiences locally specific and relevant;
- Interact with and use relevant resources (such as personnel and material from nation building departments, local technicians, craftsmen and farmers) for providing learning experiences;
- Develop action sequences related to the curriculum for intervention in the community–for enhancement of the quality of life;
- Demonstrate critical thinking (such as evaluating the learning and social situations, investigating assumptions, judging generalizations);

- Demonstrate skills for solving problems arising out of the learning/teaching situation;
- Deal with the problem of disadvantaged learners, including relevant remedial measures;
- Demonstrate behaviour of sensitive facilitators of active learning;
- Demonstrate behaviour of continuous learning.

The above specific objectives are intended to provide for the following more general objectives:

> to enable the trainees to develop the necessary skills, acquire the necessary knowledge and form the appropriate attitudes in order to fulfil the roles required by the new curriculum changes.

General strategy for learning situations

In preparation for developing the plans for in-service education in the context of curriculum change, the following chart (Figure 7) is useful as a general strategy for attempting designs since it summarizes the major operations in a learning process. The sequence postulated in the main verticle flow, i.e. beginning, to motivation, to input to learning experience, to evaluation, is the broad sequence of providing for learning. As a reminder for designing, these events are put in action boxes to indicate that within them a variety of actions are required. Further, the feedback loops from the evaluation are directed towards action in the changing of one or more of the major activities, in case the evaluation provides evidence of a negative result.

When, however, the actual designing process for a learning sequence or episode is attempted, the flow of events will change. For example although the objectives are considered in the flow chart within the box 'input', and come after the motivation, these objectives would have to be developed at the very beginning of a design process, with other actions following from this. Similarly, the evaluation and its associated criteria may have to be designed immediately after design of the objectives.

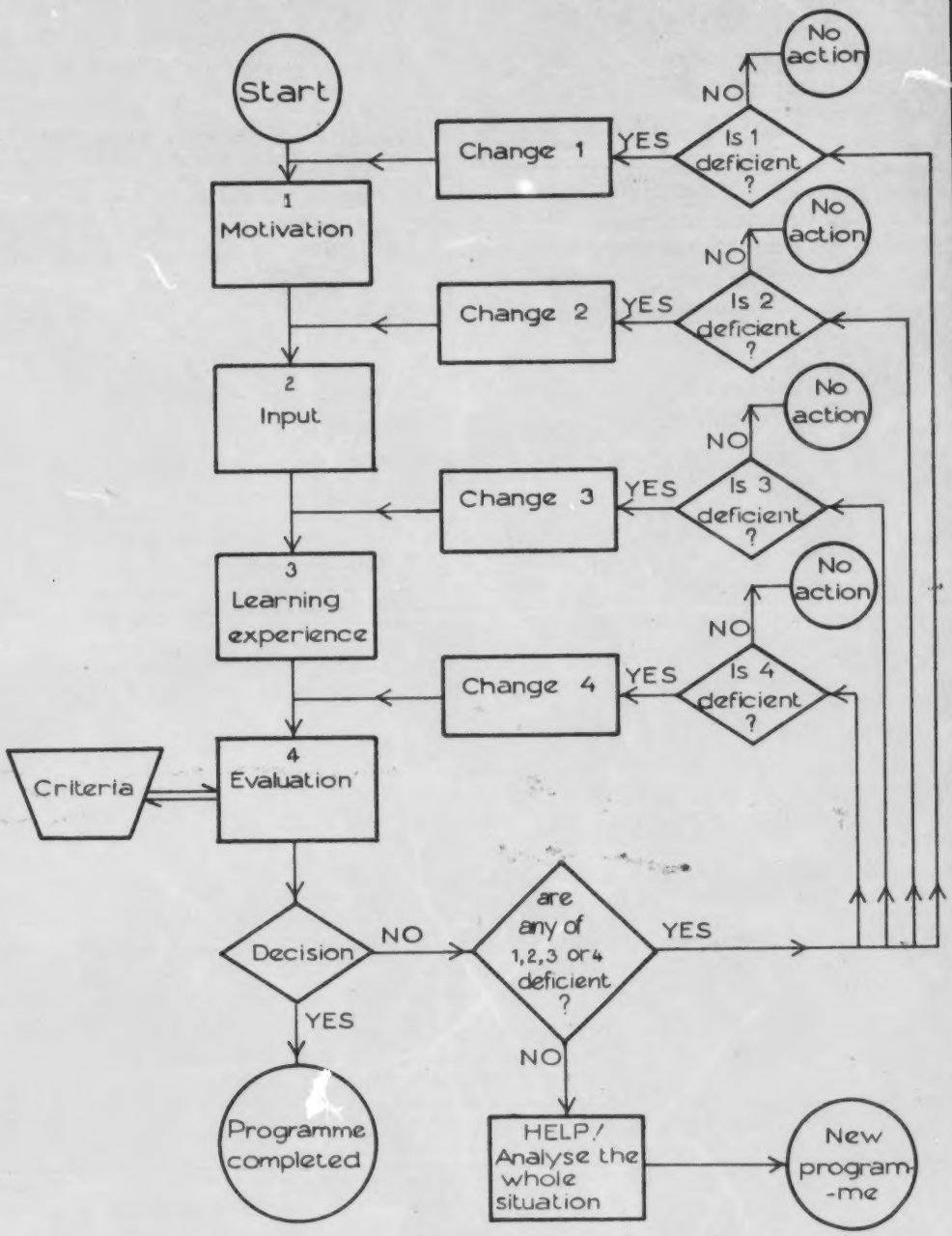


Figure 12. Major operations in a learning process

Report of syndicate task II

Theme of the task: Identification of the alternative solutions to the problem and plan for try-out.

Rationale: Once the goals and objectives for the system have been established, the system designers will explore various alternatives available to them for the accomplishment of the goals. The constraints in the selection of alternatives are many and may, in the context of in-service teacher education, include: limited time, too little space, shortages of instructors/educators/facilitators, limited instructional materials and other resources, and absence of motivation and incentives. If the task cannot be accomplished within the available resources, or resources cannot be generated with marginal adjustments, the system designer will report its termination and propose a further strategy of action.

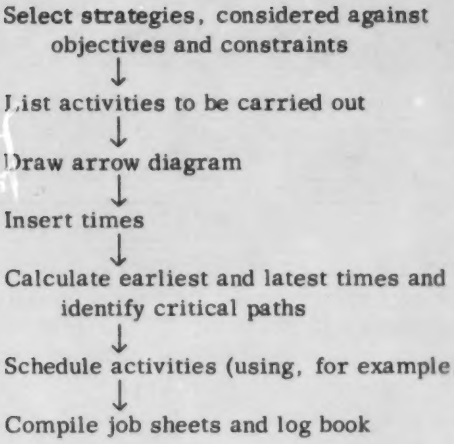
Objectives: On completion of the task, the syndicate will be able to:

1. Identify and evaluate the various strategies of providing in-service actions in the context of various constraints;
   a) Identify the various methods used for in-service actions in the countries of the region;
   b) Evaluate their feasibility in other countries of the region and suggest modifications in the light of the objectives.
2. Specify a broad strategy for in-service actions for the first cycle of education;
   a) Suggest models or strategies for in-service action for the first cycle of education;
   b) Propose an action-plan for try-out of the model(s); and
3. Write a report and recommendations.

In approaching the sub-tasks to be performed under Task II, the Syndicates made a preliminary flow chart of the activities to be undertaken. The following provides an example of the sub-tasks that were identified, which may be converted into components of a flow chart.

List strategies and methods
↓
Identify main constraints
↓
Analyse constraints in detail
↓
Identify possible strategies →

S 1


Select strategies, considered against objectives and constraints
List activities to be carried out
Draw arrow diagram
Insert times
Calculate earliest and latest times and identify critical paths
Schedule activities (using, for example, a Gannt bar chart)
Compile job sheets and log book

The Syndicate worked on Task II, again surveying the experiences of the countries in the region, and identified a wide variety of modalities being used for in-service actions. The following list is illustrative of the large number of modalities that have been utilized in the region, though not necessarily in mass programmes:

- 'Percolation'
- Distance-learning (including those with-or-without correspondence and those with-or-without radio/TV)
- 'Sandwich' courses - thick, thin and open
- Holiday courses
- On-the-spot training sessions
- Evening classes
- Day-release classes
- Mobile teams
- Scholarships and fellowships
- Sponsorships
- Action-research programmes
- Apprenticeships
- Service programmes
- Probation courses
- Cluster schools - peer learning
- Decentralized resource-centre services
- Production (of decentralized curricula/learning episodes) cum training.

This collection of modalities was then analysed for the characteristic attributes of each. This provided a basis for a generalized classification of all types of modalities in a three-dimensional framework, each dimension being significant to the major attributes of a particular mode of operation The three major dimensions considered were:

- Distance from a central organizational framework.
- Time duration of an in-service action.
- Involvement of central or local institutions/organizations/ personnel, ranging from entirely local involvement to entirely national involvement.

These dimensions are indicated in (Figure 13), and provide the planner with a framework for considering a very large number of alternatives by utilizing different combinations and permutations of co-ordinates relative to the axes of the framework. For each of the selected sets of co-ordinates (incorporating the three dimensions), further judgements have to be made against usability criteria, such as cost effectiveness, quality of output, efficiency of quality control, effectiveness of

Figure 13. Framework of alternatives in the delivery of in-service education

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evaluation, presence of dilution effects. Further, an integrated judgement has to be made incorporating all the dimensions, so that a decision may be made as to the most effective modality to be utilized.

While the three-dimensional framework provides a systematic basis for developing a large number of alternatives for consideration, a beginning has to be made to consider the constraints that are present in each of the options. Towards developing a systematic analysis of constraints, a re-clarification, such as in Figure 14, would assist in moving towards an analysis grid. The chart contains only a few of the modalities identified earlier; these are not selected with any recommended priority in view, but simply as illustration. Such a classification may then be followed by a systematic weighting of 'constraint power' in making a particular modality feasible or not in the actuality of implementation, by constructing a grid for the purpose.

Scales, such as 'Least - Moderate - Maximum', (in weighting the constraints) may be utilized. Numerical quantification given to such scales may not be amenable to arithmetical or statistical manipulation unless statistical standards are set earlier to develop comparative indices. Nevertheless, the grid given in Figure 15 does provide a focus, at least for considered judgements to be made regarding the alternatives.

In practice, a further resolution of the modalities has to be considered; i.e., into the methodologies which are contained in these modalities, such as the following:

- Assignments before, during and following the in-service course;
- Reading materials - same timing as for assignments;
- Workshops, syndicates and seminars;
- Audio-visual materials in the form of cassette tapes, films, video tapes, ETV, radio;
- Programmed modules;
- Self-learning kits;
- Demonstration;
- Micro teaching;
- Team teaching;
- Lecture;
- Field trips;
- Teaching practice;
- Case studies, profiling;
- Emulation;
- Role-playing;
- Sensitivity sessions;
- Problem-solving approach;
- Round-table meeting, discussion, dialogue, panel discussion, symposium, debate, conference, convocation, 'brainstorming', 'fish bowl';
- Interviews;
- Peer groups;
- Exchange programmes;
- Projects;
- Computer-assisted and managed;
- Keller PSI (Personalized System of Instruction);
- Evaluation - self, managed, institution.

Figure 14. Analysis of Constraints – I

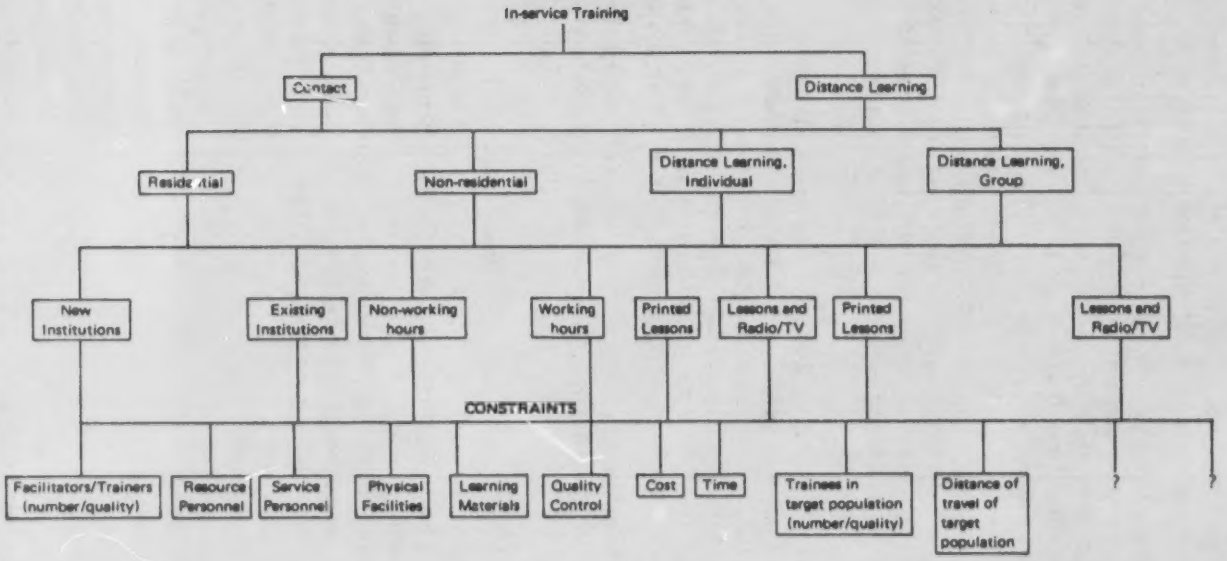

Figure 15. Analysis of Constraints – II

Alternative modalities	CONSTRAINTS									
	Facilitators/ Trainers (number/ quality)	Resource Personnel	Service Personnel	Physical Facilities	Learning Materials	Quality Control	Cost	Time	Trainees in target population (number/quality)	Distance of travel of target population
1. Residential (new in-service centres										
2. Residential (existing institutions)										
3. Non-residential (evening classes/ holidays)										
4. Non-residential (working hours)										
5. Distance Learning (individual + printed mode)										
6. Distance Learning (individual + printed mode + radio/TV)										
7. Distance Learning (printed mode + small group/workshop)										
8. Distance Learning (printed mode + radio/TV + small group/workshop)										
9. Cluster schools(peer learning)										
10. ...										
11. ...										
12. ...										

Scale Points: 1. Least 2. Moderate 3. Maximum

Using both the modalities and the methods that may be contained in them, a more comprehensive constraints analysis may be undertaken, such as indicated in the following chart (Figure 16).

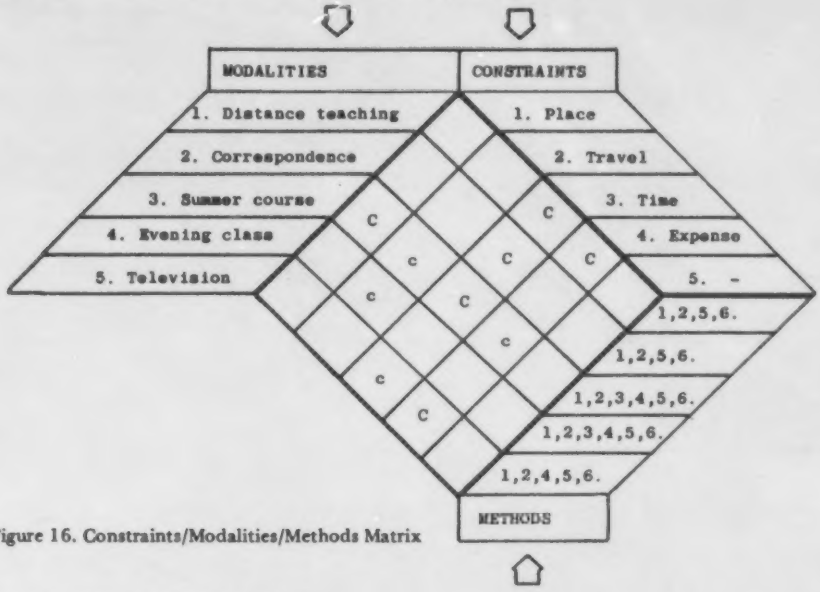

Figure 16. Constraints/Modalities/Methods Matrix

Constraints analysis matrix

The constraints analysis matrix can be used to help the educator to select a modality - and its attendant methods - while considering the constraints at the same time. For example, assuming that a short list of constraints, modalities and methods have been derived, as follows:

Constraints	Modalities	Methods
1. Place	1. Distance teaching	1. Assignments
2. Travel	2. Correspondence	2. Reading material
3. Time	3. Summer course	3. Workshop
4. Expense	4. Evening class	4. Demonstration
	5. Television	5. Case study

Then the following matrix can be used. If a major constraint exists then the intersecting square with the modality is marked with a capital 'C', if it is a minor constraint a small 'c' may be used. If no constraint exists the square is left blank.

The educator may enter into the matrix at any point, from the constraints, modality or methods, to determine the most suitable modality and to select the best methods. The major and minor constraints will differ from country to country and within a country as well. The matrix above is only an illustrative example, and is not taken from any actual case.

Network diagrams are a further level of analytical detailing for planning purposes, and are useful in deciding on and depicting the logical development of the activities to be carried out, the times during which these activities have to be accomplished, and the critical paths that have to be identified so that a schedule of activities may be installed, and major event 'milestones' denoted.

The following sequence of diagrams (Figures 17, 18, 19, 20) indicate varying examples of the use of networking as applied to one modality, (selected by consensus at the workshop), for in-service actions.

The illustrations depict a distance learning-cum-contact or face-to-face session modality only as an example and should not be taken as the only model for in-service actions in the Member States. Nevertheless, an increasing trend in the Member States, towards this model was reported at the Syndicates.

In this model, time duration is considered to be especially important in view of the cost involved, and the quantity and quality of the outcomes of the in-service action. In this context, the duration of the contact programme has to be specified, say between two and five weeks, which would have to be preceded by a 'distance' self-learning system through printed material, tapes, and other types of self-learning packages also of specified duration. Self-learning materials for the post-contact session may also be considered as a component of follow-up.

The competencies of the facilitators for the contact programme are to be enhanced by a 'national' team. The actual execution of such competence development will be conducted, however, as close to the field situation as possible. Depending upon the specific country situation, it may be done at provincial/regional, or even at district levels.

The 'national' team will prepare a self-learning set for the competence enhancement of the facilitators, building within it enough opportunities to incorporate local variations and resources to make the set specific to the situation and capable of dealing with problem situations of the geographical areas in which the learners operate.

At the organizational level, the 'national' team will prepare the basic learning packages, both for use in the pre-contact and during contact sessions, using, whenever possible, people from the 'field.' They will also divide themselves into such units or teams to facilitate the contact programmes in different geographical locations, with as much local involvement as possible, especially to endow these decentralized locations and personnel with resources and expertise to be able to conduct their own in-service actions, after a defined period such as three or four years.

The first network (Figure 17), the Contact phase of a Contact Distance-learning programme, clearly illustrates the advantages of the network approach. It shows that once the 'Collect-data' activity has been completed, taking a total of three weeks, there are four activities that could all start at once. The most important activity is that of 'Budget proposed', because it is established that it is on the critical path; i. e., it must start and finish exactly on time - if the project is to be completed as scheduled. The proposed project takes a total of 47 weeks.

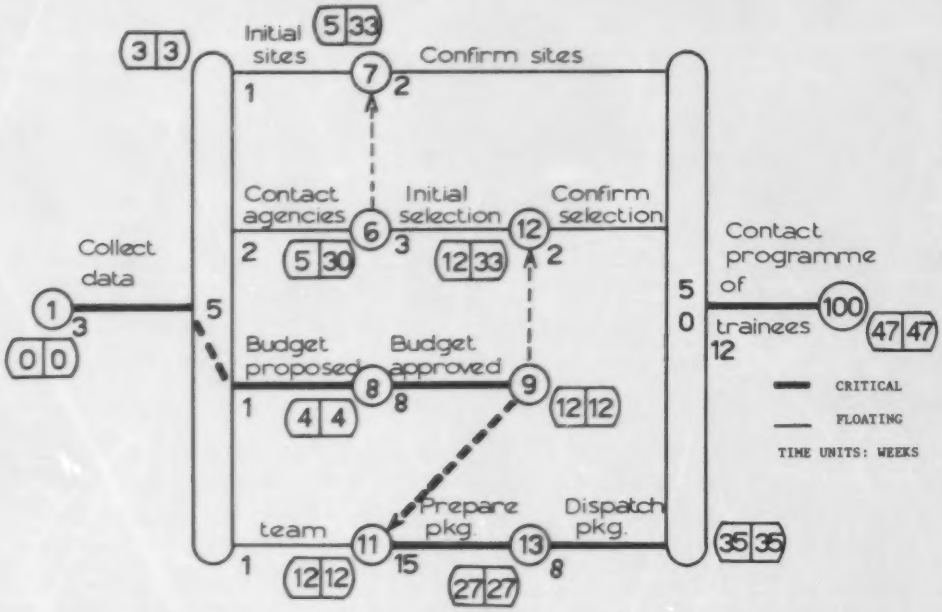

Figure 17. Network analysis of training of facilitators

The second network (Figure 18) of in-service teacher education goes into greater detail regarding the activities to be carried out. As in the first network, it shows that the production of materials is a critical and time-consuming activity. The time taken up to the beginning of the first course is 78 weeks.

The third network (Figure 19), Distance Learning, illustrates the breakdown of the programme into four phases : Preparation, Implementation, Run and Test. The first phase (Preparation) is closely detailed and reveals that a period of 60 weeks would elapse before the actual learning would start. As with the two previous networks, the critical path runs through the 'Production of Materials'.

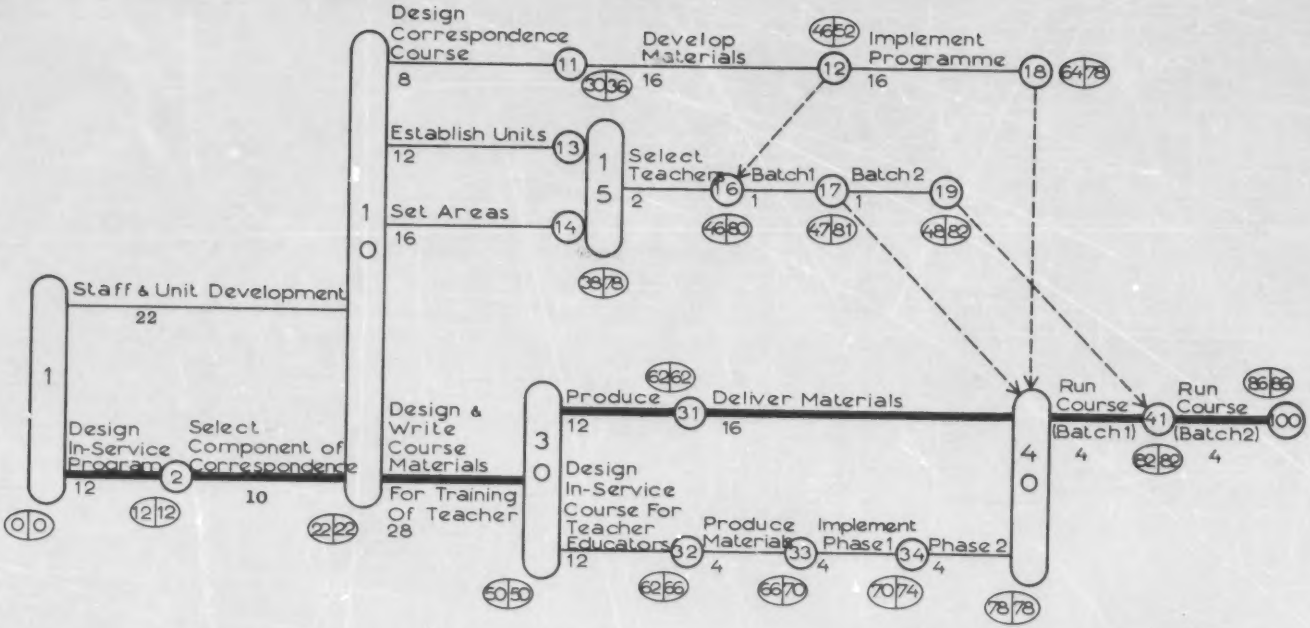

Figure 18. Network analysis of in-service teacher training

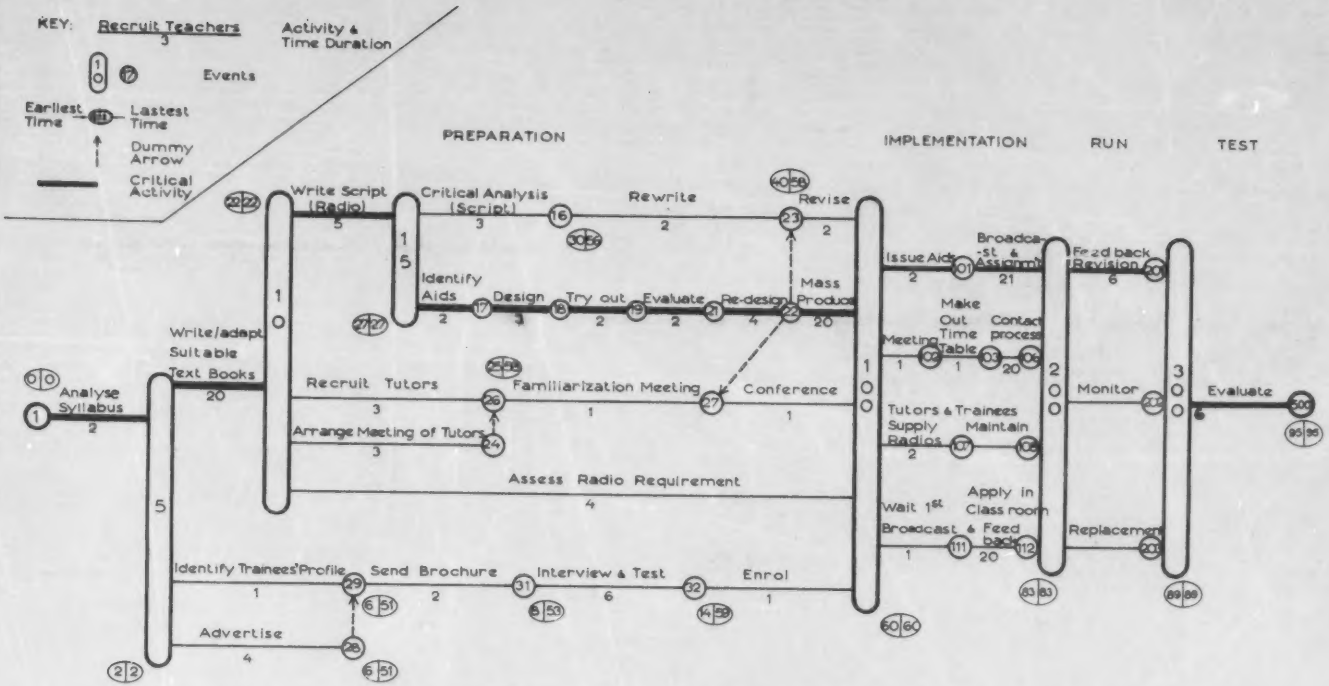

Figure 19. Network of the installation of a strategy: Distance learning (Time scale : weeks)

It is highly significant that although the three networks were all drawn in isolation, all came to the same conclusion that the production of materials takes a very long time.

Further advanced work with the third network went into the production of an example bar chart (Gannt chart), which illustrates how many activities have sub-activities that can float between set times. A further sophistication is the determination of resources required for each activity, and an intention to smooth out resource usage into the most economical pattern (Figure 20).

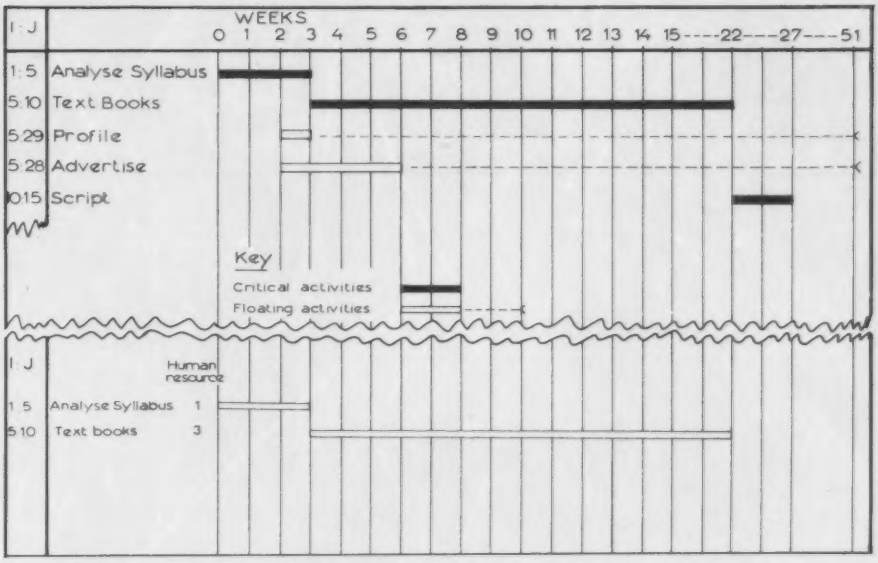

Figure 20. 'Gannt' chart for material production

The network information was also used to develop the concept of a log book, comprising 'job sheets' identifying the work to be carried out and the time constraints that were imposed. The job sheets in the log book serve as a form of evaluation that can be fed back to the project control.

After the network diagrams have been completed it is useful to develop job sheets to be assembled into log books. An example of a job sheet is indicated in the chart (Figure 21), on page 72.

Education distance learning project — Make out time table 102 _____ 103

Person(s) responsible _____

Earliest start :

Latest finish :

Actual start :

Actual finish :

Resources required:

Comments :

Figure 21. Log book page

Report of syndicate on task III

Theme of the task: Objectives and methods of evaluation.

Rationale: Implementation of a new curriculum, the introduction of a new in-service education programme, or any other innovation in the process of developing a learning/teaching system, would require systematic evaluation - of both formative and summative types. System designers will have to equip themselves with knowledge about the concepts and methodologies of different types of evaluations for different purposes. Task III was meant to develop skills in techniques of evaluation.

Objectives of the syndicate

- Develop objectives of evaluation of an in-service education programme;
- Propose a plan for evaluation suitable for countries in the region;

The general aim of evaluating an in-service education programme can be stated thus:

- To collect and analyse information to derive dues for improving the programme;

The specific aims of the programme include the following:

- To assess the organization and distribution of the following components;

  a) Materials (teaching aids, and printed);
  b) Facilitators;
  c) Learners;
  d) Facilities.

- To clarify the language and presentation of the course content;
- To assess the acquisition of knowledge and skills required of the teacher trainees;
- To assess the attitudes of trainees immediately resulting from undergoing an in-service education programme;
- To determine the change and persistence of knowledge, attitude and skills of the trainees on the job, as part of a continuous, long-term follow-up evaluation of the in-service teacher education programme;
- To evaluate the attitudes of pupils, parents, the public, and educational and administrative personnel, at all levels, towards the introduction of new teaching practices and new methodologies into the learning situation.

The pre-design stage

The Syndicates initiated activities towards the design of a plan for evaluation. One such activity was the 'brainstorming' of all aspects of an evaluation system following a coral pattern (Figure 22), the main branches being why, what, who, how, when and where.

Another activity was the identification of the main components of the system to be evaluated (Figure 23).

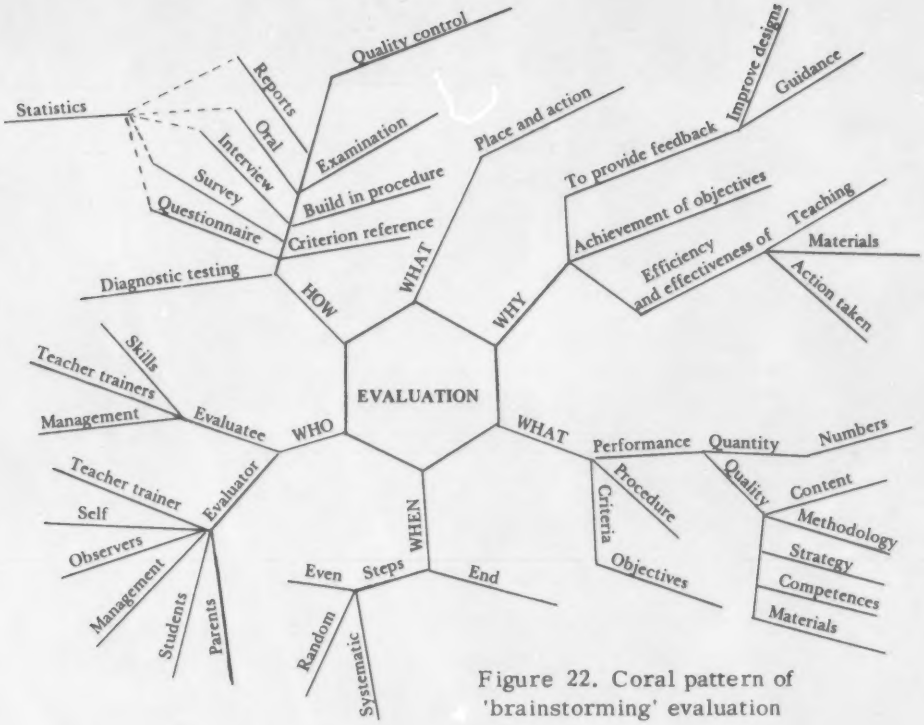

Figure 22. Coral pattern of 'brainstorming' evaluation

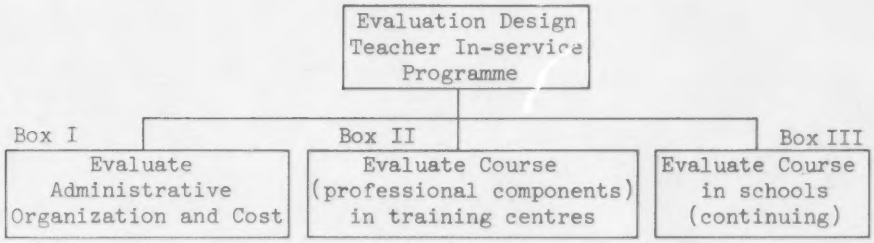

Figure 23. Components of the in-service programme to be evaluated

The design stage

Three flow charts were developed. The first (Figure 24) was a flow chart for evaluating any system, be it a ballpoint pen or an in-service evaluation programme.

The second (Figure 25) represents an algorithm of the evaluation procedures which could be applied to a combined distance-learning and contact in-service education programme.

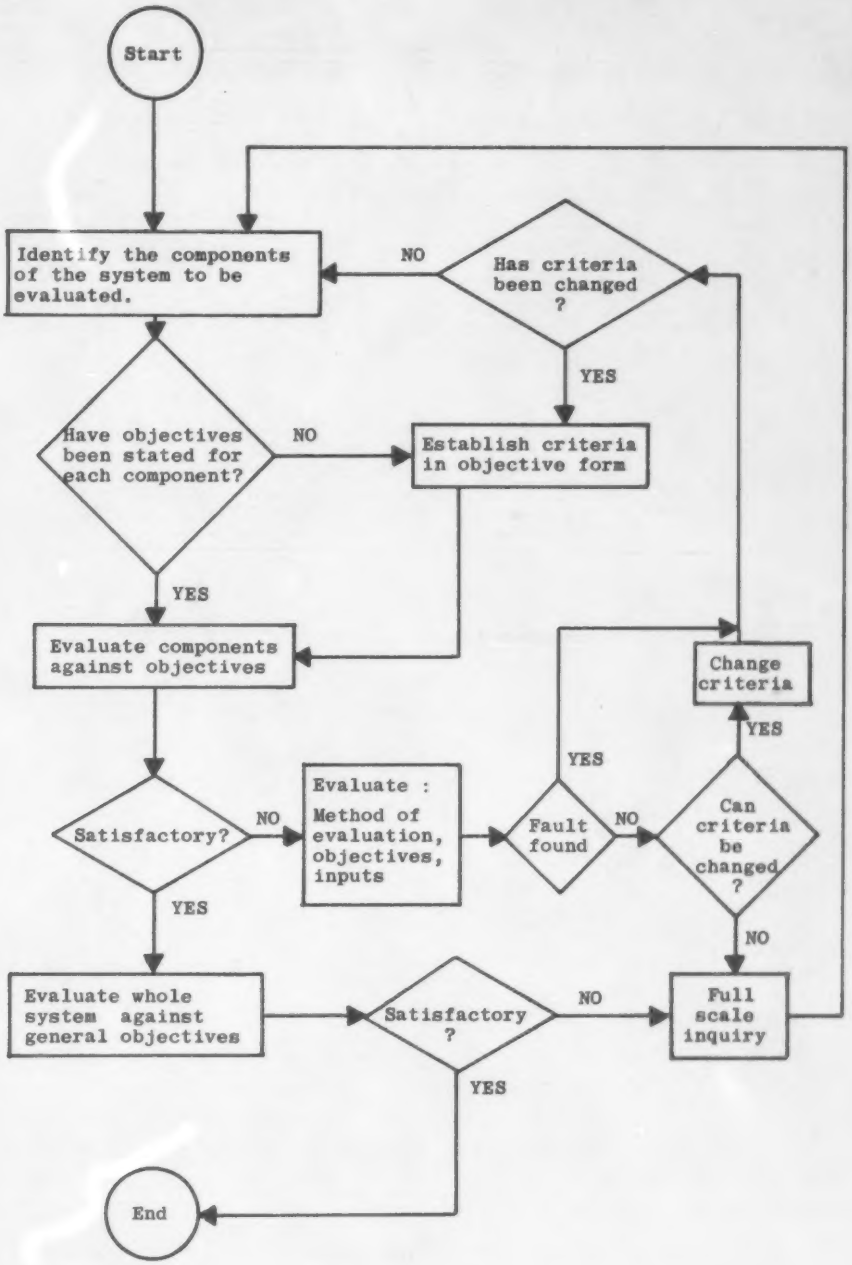

Figure 24. Flow chart of evaluation

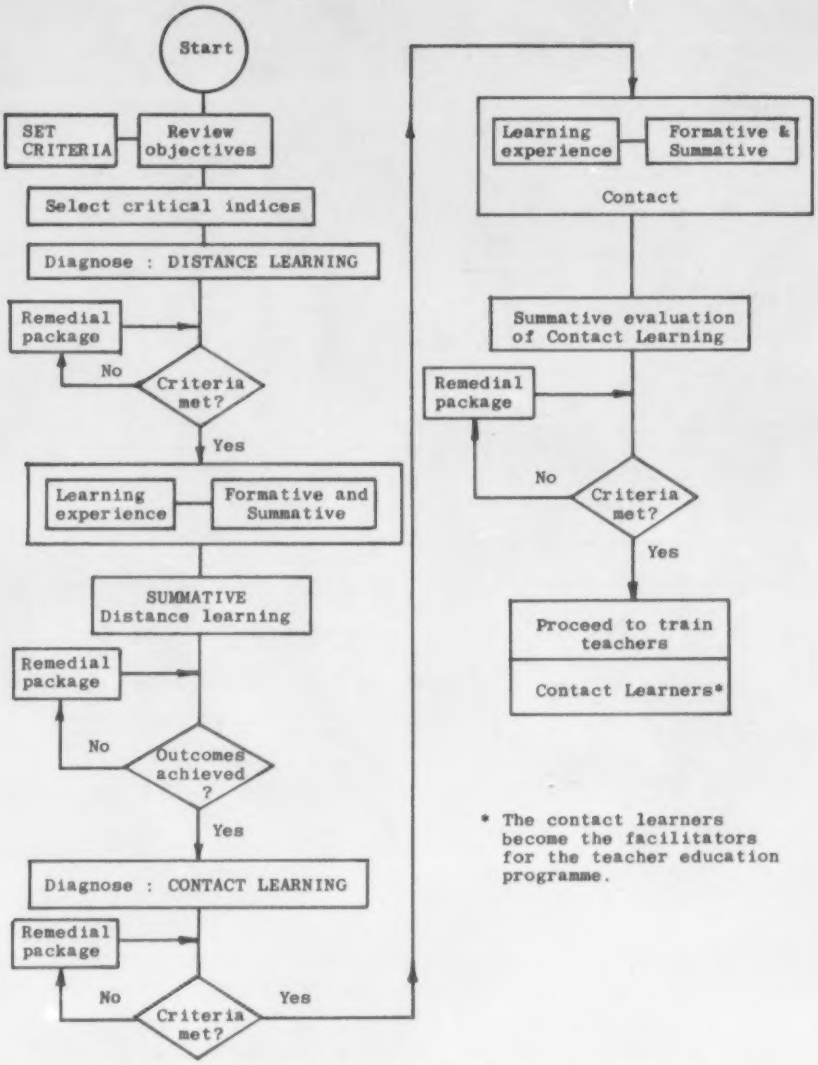

Figure 25. Action plan of the evaluation programme

The third, a combination of Figures 26, 27 and 28, expands upon the three sub-systems depicted in Figure 23.

In particular, Figure 28 includes a feed-forward loop in which modifications in each course are fed into the next course of the series. The small 'n' is the serial number of each successive course and capital 'N' is the total number of courses in the series.

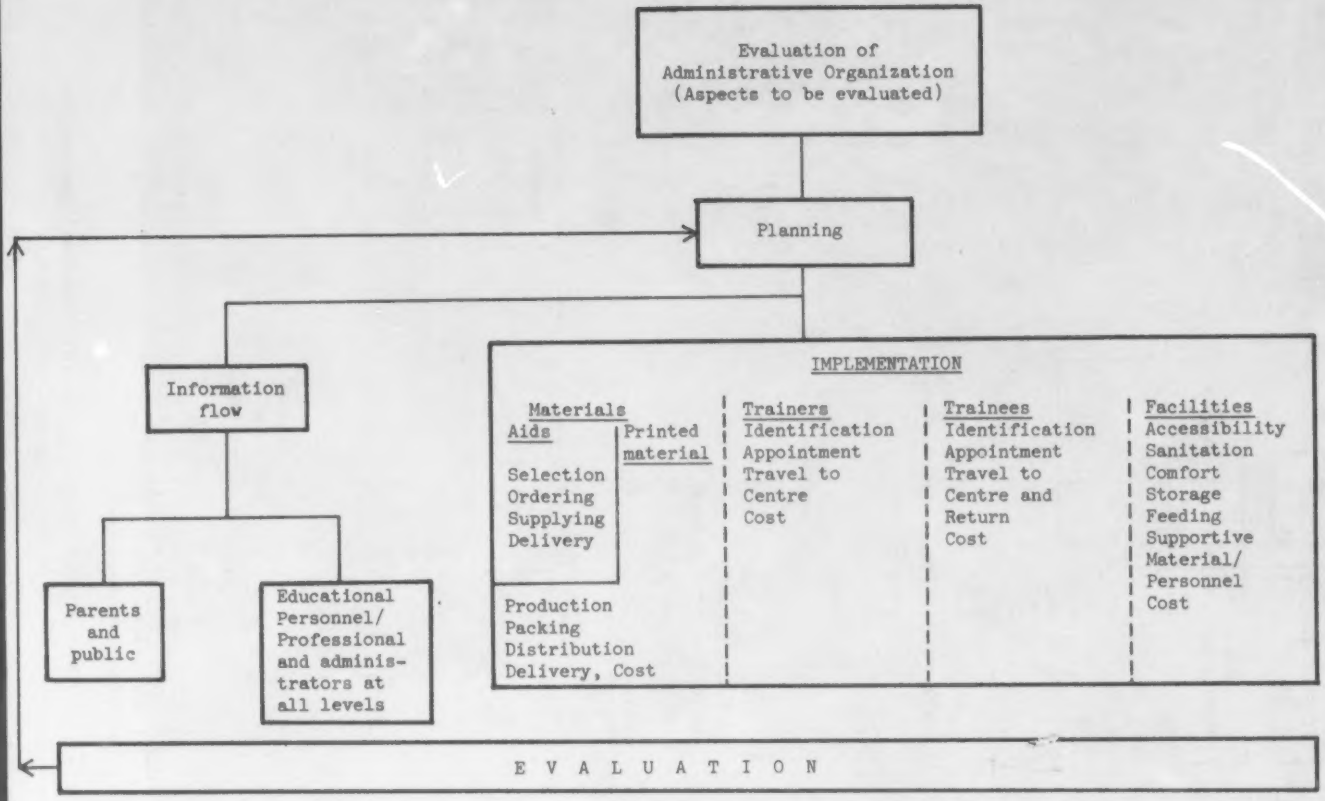

Figure 26. Evaluation of Administrative Organization, including cost

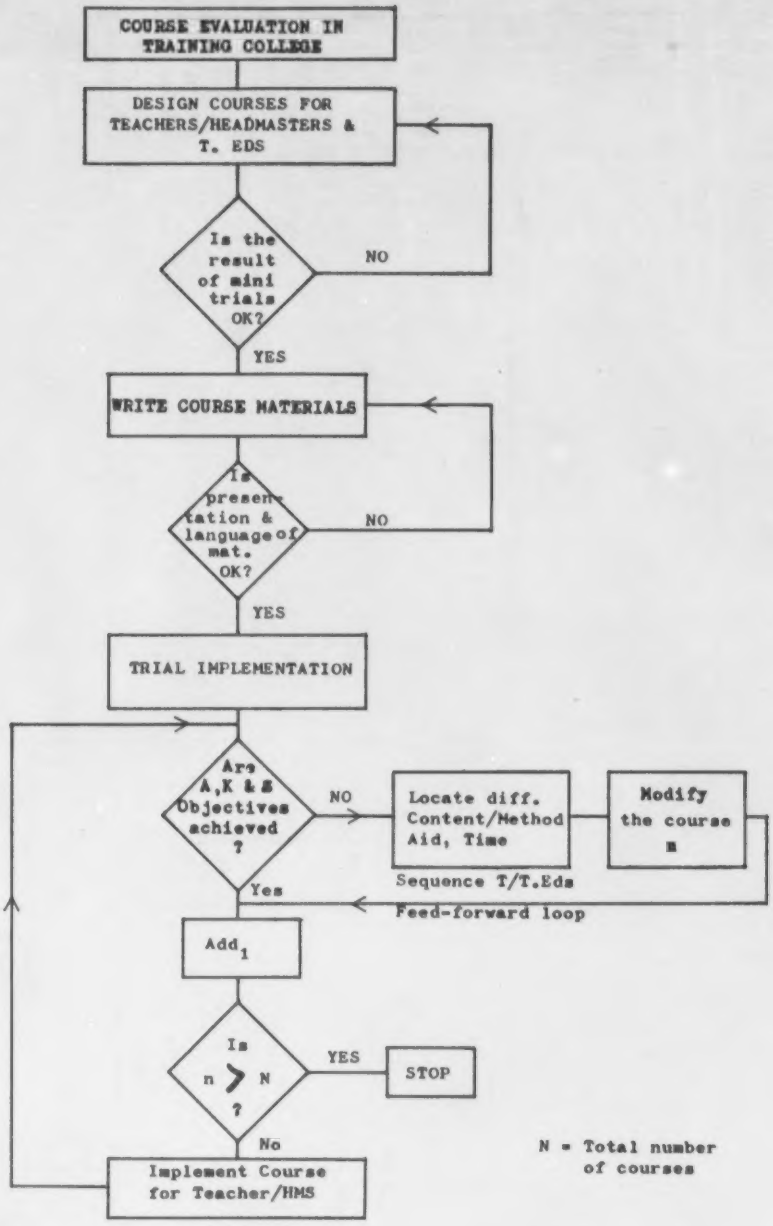

Figure 27. Flow chart for evaluating the professional components of the in-service programme

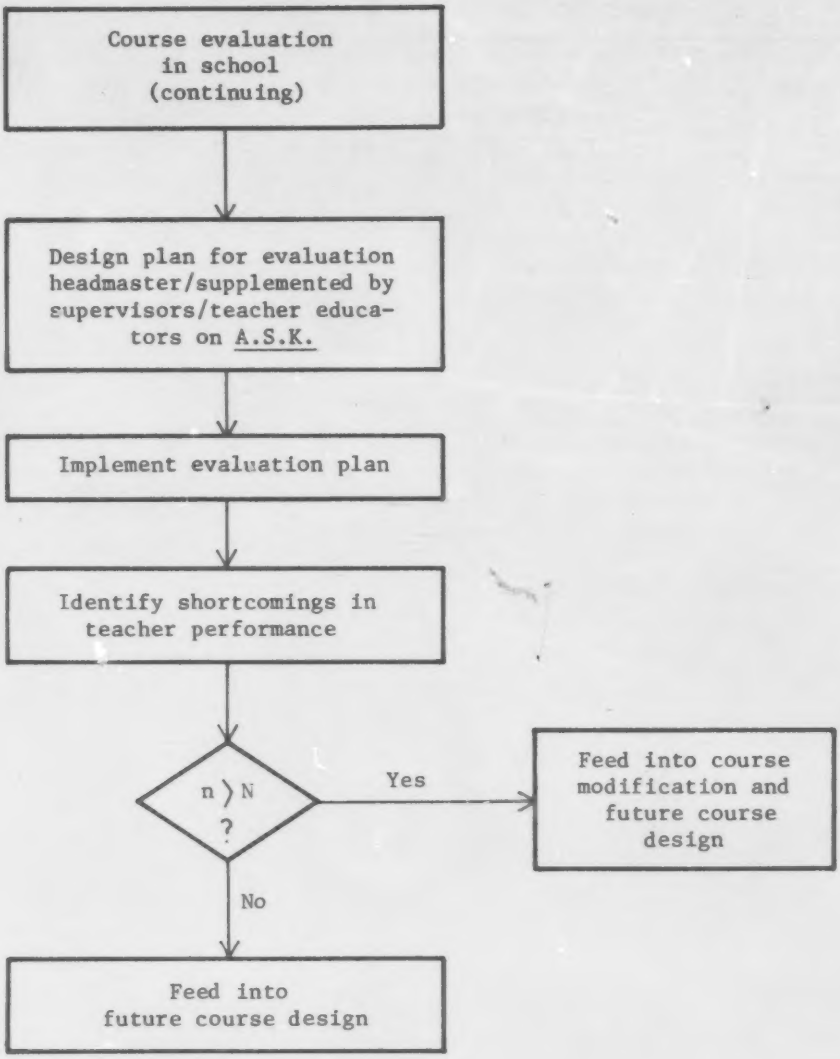
Course evaluation in school (continuing)
Design plan for evaluation headmaster/supplemented by supervisors/teacher educators on A.S.K.
Implement evaluation plan
Identify shortcomings in teacher performance
n > N ?
Yes
Feed into course modification and future course design
No
Feed into future course design

Figure 28. Flow-chart of follow-up evaluation at school level

Selection of echniques

Two instruments were developed to appraise evaluation techniques for their applicability to the different components of the system. The first (Figure 29) is a techniques/processes matrix, the processes in this case being the process boxes in the flow chart in (Figure 25).

		Observation	Interview	Questionnaire	Self-Evaluation	Peer Group	Performance Rating	Test	Any other	
1. Diagnose the learner	Distance Learning			X				X		
2. Do formative & summative eval.	Distance Learning			X	X			X		
3. Do summative evaluation	Distance Learning			X	X			X		
4. Diagnose the learners	Contact Learning	X	X	X	X	X	X			
5. Do formative & summative eval.	Contact Learning	X	X	X	X	X	X			
6. Do summative evaluation	Contact Learning	X	X	X	X	X	X			

Figure 29. Techniques/processes matrix

Tools*	Administration/ Organization	Course evaluation in training	Course evaluation in school
1. Observation checklist	X	X	X
2. Rating scales	-	-	X
3. Objective tests	-	X	X
4. Interview	X	-	X
5. Self-evaluation questionnaire	-	X	X
6. Informal discussions	X	X	-

*Criterion-referenced test principles will be the frame of reference.

Personnel	Administration and Organization	Course evaluation in training	Course evaluation in school
1. T. Eds.	X	X	HMs X
2. Teachers	X	X	-
3. Res. unit	X	-	X
4. Parents etc.	X	-	-

Figure 30. Techniques/components matrix

The second Figure 30 is a techniques/components matrix.

In each case, appropriate techniques are indicated in the boxes of the matrix.

Integrating and interpreting the evaluation information from many components

The group emphasized the desirability of developing tools for integrating the overall picture produced by the evaluation of a number of components. The tool selected by the groups is the profile which can be drawn up by giving some form of rating to each component of a sub-system. Thus, Figure 31 is a profile format of the evaluation of a number of aspects related to teaching aids. Figure 32 is a profile obtained from

Learning aids	1	2	3
1. Quantity			
2. Quality			
3. Adaptability			
4. Appropriateness			
5. Cost-effectiveness			
6. Storage capability			
7. Distribution			
8. Durability			
9. Simplicity			
10. Instruction for use			

Figure 31. Profile format for evaluating teaching aids

the evaluation of specific competencies of facilitators/learners. Figure 33 is a profile derived from the achievement of the objectives of a learning package as a whole.

Referring to the six basic questions asked by the Syndicates, the following could serve as simple but succinct guidelines for the

planning and implementation of the evaluation of in-service education programmes:

Why - To maintain or improve the effectiveness of all components of the system.

What - All components and procedures of the system.

Who - Planners, designers, administrators, facilitators, learners.

How - Each component by selected appropriate techniques.

When - As early as possible in each process and continuously as follow-up.

Where - At all levels of the in-service education system.

Competencies	No	Partial	Yes
1. Acquiring content and methodology of new curriculum			
2. Analysing and relating contrived situation to real life			
3. Guide pupil to self-learning			
4. Get involved in community programme			
5. Utilize environment in teaching/learning process			
6. Engage learners in socially productive work			
7. Implement relevant teaching methodologies and evaluation process			
8. Help children to fulfil their needs			
9. Use formal and informal learning situations			
10. Apply problem-solving skills			

Figure 32. Profile of competencies expected of Facilitators/Learners

Figure 33. A checklist to provide a profile of a learning package

Criterion	Rating scale 5	4	3	2	1
Aims and general objectives					
1. Each aim of the learning package is relevant to the purpose of the course of in-service education.					
2. Each aim gives an indication of the desired effect of subject matter on the learner.					
3. Each aim implies an aspect of teacher development.					
4. Each aim, even if long-term and broadly stated, is realistic.					
5. Each aim, while expressed in general terms, provides a basis for clear formulation of a general objective or specific objectives.					
6. Each statement mentions the task to be performed by the learner in relation to the subject matter.					
7. Each statement describes an observable behaviour, and is qualified by conditions or standards.					
8. Each general objective focuses on one area of learning outcomes.					
9. Each general objective is learner-oriented, and is prefaced by a phrase such as "At the conclusion of this course (unit) you (the learner) should be able to . . ."					
10. The general objectives contribute clearly to the achievement of one or more of the prescribed aims.					
11. The specific objectives cover adequately each general objective of the learning package.					
Selection and sequencing of content					
1. The content is appropriate for the purpose of the course, and for the entering characteristics of the learner.					
2. All relevant ideas of the new curriculum have been included at appropriate levels consistent with the course objectives.					
3. The learning package integrates objectives, ideas of the new curriculum, and the methodology and techniques of learning effectively.					
4. There is sufficient self-learning material contained in the package.					
5. There is sufficient variety in the content to maintain interest.					
6. The quantity of information to be covered is optimal for the time available.					
7. The main concepts are arranged in a manner to promote optimum learning.					
8. The sequencing is appropriate for the development at each stage of learning.					
9. There is an appropriate blend of theory and application of ideas.					
10. The total package is structured clearly in terms of its overall objectives.					
11. The content is appropriate for the distance and the contact phases of the programme.					
Strategies and methods					
1. Strategies and methods are appropriate for the entering characteristics of the learner.					

Criterion	Rating scale 5 4 3 2 1
Strategies and methods (cont'd)	
2. Strategies and methods are appropriate for the objectives they are to achieve.	
3. Strategies and methods are appropriate for the subject matter to be covered.	
4. There is an interesting variety of learning methods employed throughout the programme.	
Learning resources	
1. The learning resources effectively contribute to the achievement of course objectives.	
2. The learning resources are appropriate for the attitudes, skills, and knowledge of the learners.	
3. The learning resources are appropriate for the strategies and methods to be employed.	
4. The learning resources are readily usable by both individuals and groups of the sizes proposed.	
5. The learning resources are appropriate and practicable for use in the time and spaces available under local conditions.	
6. Learning resources identified for study of the content are either available in the community or included in the learning package.	
7. Facilitators are available who are familiar with the non-self-learning content and its presentation.	
8. The learning resources provide a suitable basis for assessment.	
Feedback procedures	
1. There is an effective system for providing learners with information on strengths and weaknesses in relation to achievement of objectives.	
2. Elements indicating the progress are clearly identifiable.	
3. Weightings of all elements indicating progress are identifiable.	
4. Elements that contribute to diagnoses are identifiable.	
5. There is a sufficient variety of assessment procedures to maintain interest and strengthen reliability.	
6. All aspects of evaluation are sufficiently reliable for their purpose.	
7. All aspects of evaluation are sufficiently valid for their purpose.	
8. Well-spaced formative evaluation is integrated in the package.	
9. The timing of all elements of the assessment programme correlates with significant points of development in the appropriate programme.	
10. The amount of assessment is appropriate for the time available, and for the workload of the learner.	
11. All procedures for assessment encourage depth of achievement and application.	
12. All aspects of the assessment programme may be communicated clearly to learners.	
13. Learners have a choice of alternative forms of assessment consistent with the objectives.	
14. All procedures for assessment are consistent with resources and methods of learners.	
15. Assessment procedures are consistent with the overall aims of the in-service programme.	
16. A suitable system has been suggested to appraise the overall effectiveness of the learner.	
17. The system of evaluation is practicable in terms of resources and methods.	

Chapter Eight

RECOMMENDATIONS : COUNTRY AND REGIONAL FOLLOW-UP PLANS

Participants developed follow-up plans as individuals of their respective countries, after a plenary discussion on the structure of the write-up. Later the plans were discussed in detail at a plenary session and revised individually. These plans, taken together, become recommendations to Member States from the Workshop, for follow-up action in the period 1979-1980.

The plans, in each case, involve enhancement of expertise in systems approach at the country level, but in the context of applying the concepts and techniques towards solving specified priority problems related to the enhancement of abilities of teachers and other educational personnel in the particular education system. Further, the problems themselves have been linked to major educational efforts in particular countries emanating from significant policy changes recently promulgated in these countries.

In Afghanistan, Bangladesh, Burma, India, Nepal and Pakistan, the problems associated with extending the first cycle of education further to reach disadvantaged populations are a main concern.

In the Philippines, Sri Lanka and Thailand, focus is on the implications of new curriculum changes, towards greater relevance and quality, and the need to re-equip large numbers of teachers for the purpose in a relatively short time.

In Singapore, Republic of Korea, and Malaysia, a further enhancement of the quality of education is given priority attention, especially continuing education of teachers in a long-term framework of 'life-long' education.

The plans, as proposed by the participants as a result of the interactions at the Workshop, are summarized in the table that follows on pages 86 and 87.

Regional follow-up action

It is recommended that Unesco, at the request of Member States:

- Provide support to country follow-up actions through expertise inputs and material assistance.

SUMMARY OF PARTICIPANTS' PLANS, BY COUNTRY*

COUNTRY	LEVEL/AREA	PROBLEM	METHOD	METHOD OF EVALUATION	UNESCO INPUTS REQUESTED		
					Personnel	Resources/ materials	Funding
Afghanistan	Elementary and Secondary	Curriculum changes	a) In-service programmes b) Workshops and Seminars	Monitoring	"	"	"
Bangladesh	Primary level	New curriculum	In-service education a) Continuous b) Periodic (one day fortnightly)	Monitoring	"	"	"
Burma	Primary	Curriculum change	a) Pilot courses b) In-service courses	Against set programme	"	"	
India	Teacher training for universalization of elementary education	Needs for more teachers 80,000 per annum Re-orientation of existing teachers	a) Individual-dissemination and research b) Regional-workshops c) National-self-learning packages-projects	Monitoring	"	--	"
Malaysia	Macro	In-service education	a) In-service courses	Against set time-table	"	"	--
Nepal	Teacher training for universalization of elementary education	Unsystematic development of programme	a) Evaluation b) Re-evaluation of curriculum c) Follow-up study of programmes	More systematic development	"	"	Funding
Pakistan	Educational projects at all levels	Unsatisfactory performance and results	a) Systematic critical evaluation b) Training personnel in management methods c) Workshops	Monitoring	"	"	"

SUMMARY OF PARTICIPANTS' PLANS, BY COUNTRY* (cont'd)

COUNTRY	LEVEL/AREA	PROBLEM	METHOD	METHOD OF EVALUATION	UNESCO INPUTS REQUESTED		
					Personnel	Resources/ materials	Funding
Philippines	Macro and micro	Evaluation research utilization	a) In-service education at macro level (distance and contact learning) b) Pre-service evaluation at micro level (research and development)	Monitoring performance checklist - questionnaires and interview-dialogues			
Republic of Korea	Primary and secondary	Too academic programmes	Phased in-service education seminars for various grades of teachers according to service	Monitoring and feedback	"	"	Study tours follow-up course
Singapore	Primary and secondary	In-service training staff development	a) In-service courses - macro and micro b) Recommendation courses c) Seminars and workshops	Performance	"	"	
Sri Lanka	Micro and macro	Refinement of in-service education	Co-ordinators from region centre Senior circuit personnel course	a) Materials produced b) Performance	"	"	--
Thailand	Grades I-VI	New curriculum, time, budget	a) Workshops for training) con- college directors) cepts supervisors) tech- of planning personnel) niques principals) and their) use	Efficacy of implementation of new curriculum	"	"	Funding

* The plans are available as a separate document.

- Provide continuous interaction between country follow-up actions and the Regional Office for Education in Asia and Oceania.
- Arrange inter-project visits, exchange of documents, and other means of sharing of experience, after the country follow-up actions are initiated (i.e. in 1980). In support of exchange of documents, provide assistance for translation into English of national materials.
- Arrange for the use of the inter-project visits to generate inter-country projects in areas of common interest and provide support for such projects.
- Arrange for the development of case studies of country follow-up actions in 1980/1981, by the participants to the present Workshop.
- Arrange for a review of country follow-up actions at a regional meeting in 1981, and of the progress of the inter-country projects, by arranging for a reconvening of participants at the present Workshop. At this (1981) regional meeting, arrange for the presentation of the case studies of country follow-up actions by the participants.

ANNEXES

AND

APPENDICES

ANNEX I

LIST OF PARTICIPANTS

Country	Name	Official Address	Personal Address
Afghanistan, Democratic Rep. of	Prof. Mohammed Amin	Professor of Education Department of Education Faculty of Letters and Humanities Kabul University, Kabul	Block 7, Apt. 26 Macroryon Kabul
Bangladesh	Mr. Md. Abdur Rashid Khan	Co-ordinator, PTI Programme Directorate of Education Dacca	Vill-Sundal pur P.O. Dosh para Dist. - Comilla
	Mrs. Selina Akhtar	Programme Officer Bangladesh National Commission for Unesco 148/G, Satmasjid Road Dhanmondi, Dacca	18/1 North Dhanmondi Dacca
Burma, The Socialist Repuplic of the Union of	U Aung Khin Myint	Principal Teacher Training School Sagaing 87	same
	U Hla Kyaw	Principal Teacher Training School Taunggyi 122 (UNICEF-sponsored)	same
India	Prof. K.C. Panda	Professor of Education Regional College of Education Bhubaneswar-751007 Orissa	AT/P.O. Subarna Pur District Cuttack Orissa
Malaysia	Mr. Goh Keat Seng	Asst. Director Teacher Training (Planning and Development) Teacher Training Division Ministry of Education First Fl. Wisma Mirama Jalan Wisma Putra, Kuala Lumpur	12 Jalan SS 4/6 Petaling Jaya Selangor
Nepal	Mr. Gopi Nath Sharma	Under-Secretary of Training Section Ministry of Education Kathmandu	392, Ram Shah Path Kathmandu 27
	Mr. Achut Man Rajbhandari	Lecturer, Institute of Education Sanothimi, Bhaktapur Kathmandu	12/457, Naghal Kathmandu
Pakistan	Mr. Habib-ur Rehman	Deputy Secretary Education Department Government of NWFP Peshawar	8, Zaryab Mansion Zaryab Colony Peshawar

Country	Name	Official Address	Personal Address
Pakistan	Mr. Malik Ijaz Ahmed	Assistant Director of Education Directorate of Education Government of Baluchistan Quetta	8-20/43, Baluchi Street Quetta
Philippines	Mrs. Balbina N. Codilla	Chief, Staff Development Division Bureau of Elementary Education Ministry of Education and Culture Manila	58, Tendido Street Quezon City
	Dr. Liduvina R. Señora	Chief Educational Researcher National Research and Development Centre for Teacher Education (NRDCTE) Ministry of Education and Culture Manila	48, Magnolia Roxas District Quezon City
Republic of Korea	Mr. Chun Ik Paik	Research Officer Chon La Nam Do Educational Research Centre 143-14 Dong Myung Dong Kwangju, Chun Nam	160 Joong Hung Dong Kwangju - 500 - Chun Nam
Singapore	Mr. Francis Wu Ven Yuen	Education Officer Staff and Training Section Ministry of Education Singapore 10	11 Siglap Gardens Singapore 15
Sri Lanka Democratic Socialist Rep. of	Mr. H. Tilakananda	Lecturer Government Teachers College Maharagama	71/18 Nawala Road Nugegoda
Thailand	Mr. Panom Kawkamnerd	Deputy Director-General Department of Teacher Training Ministry of Education Bangkok	109/4 Soi Petch Ruang Son Petchkasem Road Bankae, Bangkok
Resource Persons			
	Dr. C.K. Basu	Faculty Consultant Colombo Plan Staff College for Technician Education Paterson Road, Tanglin P.O. Box 187, Singapore 10	Block-F, 15E, Taman Serasi Singapore 10
	Miss Kamala Peiris	Director of Education Curriculum Development Centre Baudahloka Mawatha Colombo 7, Sri Lanka	6, Bellantara Road Nedimala Dehiwala Sri Lanka
	Dr. Minda C. Sutaria	Director of Elementary Education Ministry of Education and Culture Manila, Philippines	152-C R Lagmay San Juan Metro Manila Philippines
	Mr. T. Wyant	Thai-German Technical Teacher College King Mongkut's Institute of Technology, P.O. Box 8/17 Bangkok 8, Thailand	same

Annex I - List of participants

Name	Official Address	Personal Address
Resource Persons		
Dr. Nida Sapianchai	Deputy Director IPST P.O. Box 1425 Bangkok, Thailand	same
Mr. H.N. Edwardes	Unesco Expert UNDP P.O. Box 2338, Jakarta, Indonesia	same
Observers		
Mr. Wan Sangsa-ard	Director In-service Training Division Department of Teacher Training Ministry of Education Bangkok, Thailand	same
Dr. Alan Williams	Education Adviser UNICEF Office P.O. Box 1435, Rangoon, Burma	5A, Martin Avenue 5 ½ Miles, Prome Road Rangoon, Burma

Secretariat (Unesco Regional Office for Education in Asia and Oceania, Bangkok, Thailand)

Mr. Raja Roy Singh
Director

Mr. A. Chiba Deputy Director	Dr. A.W.P. Gurugé Educational Management Adviser
Mr. J. Ratnaike Educational Adviser	Mr. C.T. Crellin Educational Adviser (Unesco/UNICEF Co-operative Programme)
Mr. A.I. Dyankov Specialist in Instructional Materials (ACEID)	Mr. T.M. Sakya Educational Adviser

List of Members of the Three Syndicate Groups

Syndicate A

1. Habib-ur Rahman - Pakistan — Chairman
2. Liduvina R. Señora - Philippines
3. Achut Man Rajbhandari - Nepal
4. Chun Ik Paik - Republic of Korea
5. Aung Khin Myint - Burma
6. Francis Wu Ven Yuen - Singapore — Rapporteur

(T. Wyant/C.T. Crellin/A.I. Dyankov/T.M. Sakya)

Syndicate B

1. Balbina N. Codilla - Philippines — Chairman
2. Gopi Nath Sharma - Nepal

Syndicate B (Cont'd)

3. H. Tilakananda - Sri Lanka
4. Selina Akhtar - Bangladesh
5. Panom Kaewkamnerd - Thailand — Rapporteur
6. Malik Ijaz Ahmed - Pakistan
   (C.K. Basu/Minda C. Sutaria/J. Ratnaike/H.N. Edwardes)

Syndicate C — Chairman

1. K.C. Pandey - India
2. Mohammed Amin - Afghanistan
3. Hla Kyaw - Burma
4. Goh Keat Seng - Malaysia
5. Wan Sangsa-ard - Thailand — Rapporteur
6. Md Abdur Rashid Khan - Bangladesh
   (Kamala Peiris/Alan Williams/A.W.P. Gurugé)

Annex II

OBJECTIVES AND PRODUCTS OF THE PRE-WORKSHOP AND WORKSHOP PHASES

Objectives

The training programme is designed to provide opportunity for the participants to achieve the following objectives:

1.0 Increase their basic knowledge of the techniques of systems analysis including its philosophy, terminology and processes;

2.0 Develop their skills to apply systems analysis to educational problems at micro- and macro-levels, and to this end,

2.1 *Analyse* macro- and micro-level activities for in-service teacher education programmes at the first cycle of education of a country, including:

- Problem identification and specification of objectives
- Input assessment (resources vs constraints)
- Determination of alternative solutions
- Design for executing preferred solution
- Tryout/adjustment of execution design
- Wider execution of improved design
- Evaluation/feedback/reformulation of cycle

2.2 Develop programmes for in-country and regional multiplier actions, including:

- A plan of action for in-service education at the first level of education for the country.
- Guidelines for design and development of training programmes and supportive resources for enhancing national capacities for use in systems approaches.
- Recommendations for possible actions in the region as follow-up of country implementation.

Major material products

At the end of the Workshop, the participants will be able to take to their countries resource material including:

- A package of materials on the basic philosophy, terminology, processes and techniques of the systems approach;
- Case studies illustrating the application of the systems approach to selected, country-specific micro- and macro-level education problems;

- Action plans illustrating the application of the systems approach to selected, country-specific educational problems;
- A regional plan for co-operation and continuation of work;
- Basic reference documentation related to the systems approach;
- Other resource materials.

Main tasks related to the objectives of the Workshop

During the Workshop, it is expected that the following major tasks will be accomplished:

Objective 2.1: Analyse macro- and micro-activities for in-service teacher education programmes at the first cycle of education of a country:

- Identify the components of an in-service education programme as a system.
- Determine the relevance of the objectives to the problems identified.
- Determine if there is evidence that resources and constraints have been assessed.
- Identify the strengths/weaknesses of the programme as a system.
- Evaluate the alternative solutions.
- Assess the possibility of attaining the objectives through execution of the preferred solution.
- Check the evaluative strategies against the objectives.
- Assess the programme as a system and propose adjustments.

Objective 2.2: Develop programmes for multiplier actions:

2.2.1 A plan of action for in-service education at the first cycle of education for the country:

- Identify critical problems in multiplying the effects of in-service education.
- Specify the objectives of the multiplier action programme.
- Formulate success indices.
- Assess the resources/constraints in executing the programme.
- Consider alternative solutions to the problems.
- Develop a design for executing the preferred solution.
- Formulate evaluative strategies for the programme.
- Translate the design into a diagram.
- Evaluate the design.
- Make adjustments to the design.

2.2.2 Guidelines for design and development of training programmes and supportive resources for enhancing national capacities for using systems approaches:

- Formulate recommendations for the design and development of training programmes.

- Formulate criteria for the design and development of study and reference materials.
- Select materials useful for country actions.
- Prepare basic documentation lists.
- Compile resource materials.

2.2.3 **Recommendations for possible actions in the region as follow-up of country implementation:**

- Recognize individual country actions and follow-up programmes.
- Formulate recommendations for design and development of regional actions.

Themes of the Workshop

20 November (Monday)

S 1 – Analysis and discussion of problems in educating learners in the age group 5/6 years to 14 years (as identified by the participants and presented in their assignment - problems list and case studies) - PLENARY

S 2 – Continuation of analysis and synthesis of country problems - PLENARY

S 3 – Clarification of concepts, terminology, techniques and the like of the systems approach - PLENARY

21 November (Tuesday)

S 1 – Clarification of concepts, terminology, techniques, etc. of the systems approach - PLENARY

S 2 – Specification of objectives related to the problems identified in the case studies - PLENARY

S 3 – Consideration of strategies for solving problems identified in the case studies - PLENARY

22 November (Wednesday)

S 1 – Continuation of discussion on strategies for solving problems identified in the case studies - PLENARY

S 2 – Discussion of alternative strategies, executing preferred solution, try-out/adjustment, and wider execution of improved design with reference to the case studies - PLENARY

S 3 – Discussion of evaluation/feedback/reformulation of cycle with reference to the case studies - PLENARY

23 November (Thursday)

S 1 – Specification of objectives and development of frameworks for analysis - Group Work

S 2 – Detailed analysis and discussion of case studies (developed as assignments) and alternatives - Group Work

S 3 – Task analyses and formulation of criteria for evaluation - Group Work

S 4 – Continuation of analyses and discussion of case studies - Group Work

24 November (Friday)

S 1 – Progress Report of Group Work - PLENARY

S 2 – Adjustments to Action Plan of Workshop - PLENARY

S 3 – Refinement of case studies and alternatives - Group Work

S 4 – Self-study

S 5 – Refinement of case studies and alternatives - Group Work

S 6 – Self-study

25 November (Saturday)

S 1 – Progress Report of the Group Work - PLENARY

S 2 – Adjustment to Action Plan of Workshop - PLENARY

S 3 – Finalizing the Group Report - Group Work

S 4 – Continuation of finalizing the Group Report - Group Work

26 November (Sunday)

FREE DAY

27 November (Monday)

S 1 – Presentation of finalized Group Report - PLENARY

S 2 – Adjustment to Action Plan of Workshop - PLENARY

S 3 – Integration of macro- and micro-country case studies and alternatives - Group Work

S 4 – Self-study

S 5 – Continuation of refinement of integrating macro- and micro-country case studies and alternatives - Group Work

S 6 – Self- study

28 November (Tuesday)

S 1 – Presentation of integrated macro- and micro-country case studies and alternatives - PLENARY

S 2 – Adjustment to Action Plan of Workshop - PLENARY

S 3 – Development of Country Follow-up Plans - Group Work

S 4 – Continuation of development of Country Follow-up Plans - Group Work

S 5 – Self-study

29 November (Wednesday)

S 1 – Presentation and discussion of Country Follow-up Plans - PLENARY

S 2 – Continuation of presentation and discussion of Country Follow-up Plans - PLENARY

30 November (Thursday)

S 1 – Development of general criteria for evaluation design for products of Workshop (case studies/follow-up) - PLENARY

S 2 – Continuation of development of general criteria for evaluation design for products of Workshop - Group Work

1 December (Friday)

S 1 – Presentation and discussion of evaluation design - PLENARY

S 2 – Evaluation of Workshop - PLENARY

2 December (Saturday)

S 1 – Finalizing Documentation - Individual/Group Work

S 2 – Finalizing Documentation - Individual/Group Work

S 3 – Presentation of Draft Final Report

S 4 – Closing Ceremony

ORGANIZATION OF THE WORKSHOP

In the following table the themes, objectives, and methods of work of the Workshop are listed to set out the overall organization. The numbering refers to the objectives and sub-objectives.

Analysis of Work Sessions

Theme	Related objective	Method of work	Methodologies
20 November			
Analysis and discussion of problems in educating learners in age group 5/6 years to 14 years (as identified by the participants and presented in their assignment - problems list and case studies).	1.0, 2.0, 2.1.1	Plenary	Participants present problems verbally and analyse them (supported by written material and synthesis).
Continuation of analysis and synthesis of country problems.	1.0, 2.0, 2.1.1	Plenary	Participants present problems verbally and analyse them (supported by written materials and synthesis).
Clarification of concepts, terminology, techniques etc. of the systems approach.	1.0	Plenary	Presentation and Large Group discussion.
21 November			
Clarification of concepts, terminology, techniques, etc. of the systems approach.	1.0	Plenary	Participation and Large Group discussion.
Specification of objectives related to the problems identified in the case studies.	1.0, 2.1.1	Plenary	Large Group structured discussion.
Consideration of strategies for solving problems identified in the case studies	1.0, 2.1.2, 2.1.3	Plenary	Large Group structured discussion.
22 November			
Continuation of discussion on strategies for solving problems identified in the case studies.	1.0, 2.1.2, 2.1.3	Plenary	Large Group structured discussion.
Discussion on alternative strategies, executing preferred solution, try-out/adjustment, and wider execution of improved design with reference to the case studies.	1.0, 2.1.4, 2.1.5 2.1.6	Plenary	Large Group structured discussion.
Discussion of evaluation/feedback/reformulation of cycle with reference to the case studies.	1.0, 2.1.7	Plenary	Large Group structured discussion.
23 November			
Specification of objectives and development of framework for analysis.	1.0, 2.1	Group Work	Presentation and Large Group discussion

Theme	Related objective	Method of work	Methodologies
23 November (cont'd)			
Detailed analysis and discussion of case studies (developed as assignments) and alternatives.	2.1	Group Work	Large/Small Group discussion.
Task analyses and formulation of criteria for evaluation.	1.0, 2.1	Group Work	Presentation Group discussion (two groups).
Continuation of analyses and discussion of case studies.	2.1	Group Work	Large/Small Group discussion.
24 November			
Progress Report of Group Work.	2.1	Plenary	Presentation of Group Work.
Adjustments to Action Plan of Workshop.	2.0	Plenary	General discussion.
Refinement of case studies and alternatives.	2.1	Group Work	Small Group Work (if selected case studies are taken) or Individual (if each participant takes his own case studies).
Self-study.	1.0, 2.0, 2.2.2	Self-study	Small groups with similar problems/ individuals use library or facilitators.
Refinement of case studies and alternatives.	2.1	Group Work	Small Group Work (if selected case studies are taken) or Individual (if each participant takes his own case studies).
Self-study.	1.0, 2.0, 2.2.2		Small Groups with similar problems/ individuals use library or facilitators.
25 November			
Progress Report of the Group Work.	2.1	Plenary	If D5 S2 was in small groups, presentation in small groups. If D5 S3 was individual work, presentation of selected case studies.

Theme	Related objective	Method of work	Methodologies
25 November (cont'd)			
Adjustment to Action Plan of Workshop.	2.0	Plenary	General discussion
Finalizing the Group Report.	2.1 2.1	Group Work	Small Group Work.
Continuation of finalizing the Group Work	2.1	Group Work	Small Group Work.
26 November	F R E E D A Y		
27 November			
Presentation of finalized Group Report.	2.1	Plenary	Presentation by one representing group.
Adjustment to Action Plan of Workshop	2.0	Plenary	General discussion.
Integration of macro- and micro-country case studies and alternatives.	2.0, 2.1, 2.2	Group Work	Small Group Work.
Self-study	1.0, 2.0, 2.2.2	Self-study	Small Group with similar problems or Individuals, use library facilities.
Continuation of refinement of integrating macro- and micro-country case studies and alternatives.	2.0, 2.1, 2.2	Group Work	Small Group Work.
Self-study.	1.0, 2.0, 2.2.2	Self-study	Small Group with similar problems or Individuals, use library facilities.
28 November			
Presentation of integrated macro- and micro-country case studies and alternatives.	2.2, 2.3	Plenary	General discussion.
Adjustment to Action Plan of Workshop.	2.0	Plenary	General discussion.
Development of Country Follow-up Plans.	2.2	Group Work	Small Group Work.
Continuation of development of Country Follow-up Plans.	2.2	Group Work	Small Group Work.
Self-study	1.0, 2.0, 2.2.2	Self-study	Small Group with similar problems or Individuals, use library facilities.

Theme	Related objective	Method of work	Methodologies
29 November			
Presentation and discussion of Country Follow-up Plans.	2.2 2.3	Plenary	Presentation by each Small Group.
Continuation of presentation and discussion of Country Follow-up Plans.	2.3	Plenary	Presentation by each Small Group.
30 November			
Development of general criteria for evaluation design of products of Workshop (case studies/follow-up).	1.0, 2.1, 2.2	Plenary	Group structured discussion.
Continuation of development of general criteria for evaluation design for products of Workshop.	2.1, 2.2	Group Work	Small Group Work.
1 December			
Presentation and discussion of evaluation design.	2.0	Plenary	General discussion.
Evaluation of Workshop.	2.0	Plenary	Panel (general) discussion, and questionnaire.
2 December			
Finalization of documentation.	Collect material outcomes of Workshop.	Individual/ Group Work	Individual/Small Group.
Finalization of documentation.			

Annex III

LIST OF DOCUMENTS
ISSUED TO THE PARTICIPANTS DURING THE WORKSHOP PHASE

	Number
A. Information Documents	
- General Information	ROEAO-78/SAFETIP/INF.1
- First Week Schedule of Work	ROEAO-78/SAFETIP/1A
- First Week Schedule of Content Sessions	ROEAO-78/SAFETIP/1B
- Second Week Schedule of Work	ROEAO-78/SAFETIP/1C
- List of Participants and Syndicate Members	ROEAO-78/SAFETIP/INF.3

B. Working Documents

- Participants' Assignments (submitted to Workshop)
  Afghanistan, Bangladesh, Burma, India, Malaysia, Nepal, Pakistan, Philippines, Republic of Korea, Singapore, Sri Lanka, Thailand
- Working Paper No. 1 - Syndicate Work
- Working Paper No. 2 - Selected Discussion issues on Problems in the Education of Teachers and other Educational Personnel
- Working Paper No. 3 - Methods of Task Analysis
- Working Paper No. 4 - Objectives in Learning Systems
- Working Paper No. 5 - Evaluation in the Context of Systems Approach
- Working Paper No. 6 - Training Modalities and Instructional Methods

C. Background Documents

- Management Techniques (classified by objectives)
- Evaluation (A General Plan and Checklist of Critical Questions)
- Instructional Planning (Design and Delivery for Technician Courses)
- How to make an Ability Analysis for the Design of a Syllabus
- How to select the Most Appropriate Teaching Aid in the Urban Environment

Annex IV

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Appendix I

NOTES ON SYNDICATE WORK

Introduction

Participants

The participants of this Workshop are responsible for planning, administration, and managing education and training in countries in the region. They enjoy the status of Director, Principal, Head of Department, or Teacher Educator in their respective countries and have several years of experience of working under difficult conditions.

Learning strategies

Several strategies are proposed to provide a variety of learning experiences to achieve the Workshop objectives. The strategies include:

- Lecturing/theme presentation;
- Syndicate work;
- Self-study;
- Project work;
- Non-formal interaction with faculty and other participants.

The participants will spend approximately 50 per cent of their time in Syndicates. This is their main learning experience. This note attempts to analyse this area of work.

Aims of syndicate work

Cognitive, psychomotor and affective objectives

Although the aims and objectives of courses are carefully designed and structured, often the implementation of a proposed plan takes note of the cognitive aspects of the course and neglects the affective and psychomotor domains. It is suggested that in the syndicate work, emphasis be given to the objectives of each task as well as the overall objectives of the Workshop covering all the objectives. Some possible objectives include the following:

A set of objectives for syndicate work

- Formulate and define the problem from the Task given;

- Identify the factors relevant to the problem;
- Share information and experience related to the problem;
- Critically examine various information gathered;
- Propose alternative strategies to achieve task objectives;
- Examine the applicability of a strategy in a given country situation;
- Arrive at an agreed solution;
- Deepen understanding of the concepts through discussion;
- Develop problem-solving techniques;
- Speak in a group and improve oral communication;
- Listen to others;
- Summarize the main points;
- Sharpen interpersonal competencies;
- Develop non-verbal communication skills;
- Increase awareness of variety of opinions;
- Develop a healthy respect for other views;
- Develop tolerance to other people's mistakes, ideas and views;
- Increase confidence in speaking in a group;
- Develop motivation and interest to examine an issue in a logical fashion;
- Develop insight into one's own bias/prejudice;
- Develop an attitude towards accepting group decisions;
- Express personal opinion without offending others;
- Share in the responsibility of presenting, exploring and understanding ideas.

Aspects of syndicate work

Three aspects of syndicate work

Three interdependent aspects of syndicate work need to be examined carefully to achieve syndicate objectives. The aspects are:

1. The Task;
2. The Structure; and
3. The Process.

The Task. Questions related to the Task include the following:

- How should an information pool be developed in the syndicate, within the limited time available?
- How should information be analysed, synthesized and evaluated, to generate alternatives/solutions?
- How should a decision be taken regarding the final solution?
- How relevant is the solution in the particular participant's country context?

The Structure. Questions related to the Structure include the following:

- How many members should be assigned?

- How much time should be allowed?
- Who should conduct the business?
- How should the decisions be taken?
- How should the decisions be recorded and communicated?
- How should the Plenary Session be conducted?
- How should lively discussions be generated in the Plenary Session?

The Process. Questions related to the Process include the following:

- How should motivation be generated?
- How should logical and analytical thinking be developed?
- How should participants be assisted to express ideas orally?
- How should insights into the problems be developed?
- How should convergent and divergent thinking be developed?
- How should participants be assisted to see other points of view?
- How should participants be assisted to work as a member of a team?

Basic learning principles

Active participation of the learner is the basic principle employed in the 'syndicate'. Participants are reinforced immediately by approval (or non-approval) of their ideas. The motivation of the participants is made to remain high through the process of enquiry and problem-solving. The other principle which has considerable influence in changing behaviour in the affective domain is the group dynamics. Group influence and group work often bring about more permanent changes in attitudes and values than the individual work. In a syndicate, there is a dynamic interaction, a give-and-take; it provides opportunities for the development of perceptions of people and for practising social and communication skills.

What the syndicate looks like

Participants of a course are divided into syndicates (groups) of from six to nine. Each group represents a fair cross-section of the entire group of participants in terms of their country of origin, levels of responsibility, maturity and experience. There are many criteria that can be used for the constituency of syndicate groups, including the following:

- Country of origin (persons from the same country not in the same group);
- Area of expertise (engineers, managers, planners and so on in different groups);
- Sex (both sexes in all groups);
- Rank (directors, heads of departments, teachers spread between groups).

The Task. Each syndicate is given a syndicate task or a problem, to be studied in depth. Some of these tasks are structured, and some are not. Some are in the form of case studies, some envisage role-playing activities.

The Organization. Each syndicate appoints or elects a chairman, who conducts the business of the syndicate and also presents the syndicate report at the Plenary

Session. Each syndicate also elects or appoints a secretary to write the report of the syndicate for presentation by the chairman in the plenary session. All the participants of the workshop get opportunities to discuss individual syndicate reports at the plenary session.

The Facilitator. One or two facilitators are associated with each syndicate, their task is not to instruct in the conventional way, but to guide and assist the discussion, in order to complete the syndicate task within the limited time available. To assist participants to work in syndicates, 'hand-outs' may be distributed.

The syndicate task facilitator

Role of the facilitator

The role of the facilitator is very difficult and changes between syndicates and even within a particular syndicate, from session to session. For these reasons, it is difficult to delineate a particular role. The role may be divided into three phases: before, during, and after the syndicate meeting.

Before the syndicate meeting, the facilitator's role would include the following:

- Planning and preparing the syndicate task: care needs to be taken in preparing the task so that it facilitates the achievement of the syndicate objectives. The task should also have relevance within the overall objectives of the workshop, and this should be made explicit to the participants.

Before the syndicate

- Orientation of the participants: care needs to be taken to prepare reading material for the participants, to familiarize them with their role and behaviour during the syndicate. In addition, the participants have to be briefed about the 'process' of syndicate work.
- Listing pertinent issues to stimulate thinking and 'warming-up' of the discussions.
- Checking physical arrangements; care needs to be taken about seating arrangements (close; not too formal; in a circular or semi-circular setting). Arrangements for blackboard or other writing surfaces with plenty of wall space are needed.

During the syndicate

During the syndicate meeting, the basic dilemma for the facilitator is whether to be a pro-active, re-active, or to remain an inactive observer. Should the focus be on the task or on the process? The facilitator has to:

- encourage free and frank expression of feelings of the participants;

- provide information, and making task-oriented suggestions when necessary;
- provide feedback;
- provide interpretation about the process-at-work, particularly when the progress of the group is not smooth;
- make process-oriented suggestions;
- help the secretary and the chairman of the syndicate in summarizing the discussion;
- help in setting up the norms for the syndicate and in building up a constructive and creative psychological climate for syndicate work.

After the syndicate

After the syndicate meeting, the facilitator needs to evaluate the syndicate work and undertake corrective measures where necessary. Experience of all the facilitators may be pooled together to make further improvements.

Possible roles for the facilitator and when they may be used include the following:

Role	Possible uses
Informing	– ensuring that all participants understand the task; – clearing up misunderstandings or misconceptions; – asking questions and raising issues, then giving answers only if necessary.
Structuring	– explaining the objectives of the task at the start, if the chairman is unable to do so; – drawing attention to the aims, if the discussion wanders too far away from the focus for too long; – drawing the discussion to a close and summarizing main findings.
Supporting	– asking for reactions and drawing in reticent members through stimulating questions; – showing an awareness of possible criticism and anxiety; – interrupting constructively tense silences, and supporting contemplative ones.
Providing a mode	– demonstrating the sort of behaviour required for syndicate work; – summarizing conclusions arrived at by consensus in a carefully worded manner.
Encouraging change	– challenging rigid stands taken in the discussions; – drawing attention to contradictory and inconsistent statements.

It is important that at least one facilitator be present with the group at all times, in order that problems can be immediately overcome. It is also important to have continuity of facilitator within a particular group. In this manner, rapport can be built up between a particular syndicate group and the facilitator.

The following may be included as inputs to the syndicate work:

- Objectives for each task in each of the cognitive, psychomotor, and affective domains;
- Resources that may be useful for discussions on the task (e.g. theme papers, background papers, self-study material, booklists);
- Alternative approaches to the task (e.g. whole group discussion, personal study, personal tasks, tasks delegated to smaller groups).

Preparation of syndicate reports

Importance of strategy

The main concern of a syndicate group is to find solutions to identified problems, and prepare a coherent and usable report. It is important that the facilitator accentuate the importance of the discussions and the problem-solving techniques that are used. In order to accentuate these aspects, it can be made clear from the outset that the facilitator will sit with the chairman and the secretary after the final syndicate session, in order to assist with the report. This assistance can be in terms such as those of subject content of report; clarity of language; or fabrication of visual material.

Often the group chairman feels uncomfortable at the thought of having to give the report. The facilitator's assistance in writing the report and in the production of visual materials can help in overcoming this problem.

Plenary sessions

Quality of discussion

Plenary sessions must be based upon a coherent and usable report, followed by high quality discussion on the reports by as many of the participants as possible. To improve the quality of discussion in these sessions, the chairman of the plenary session, the chairman of the syndicate groups, and the facilitators, must remain alert and involved. Objectives of the session must be clearly identified beforehand.

Objectives of plenary sessions

The plenary session should have its own objectives which should be stated. These objectives may include:

- observing similarities between reports;
- observing differences between reports;
- gauging the 'best' solution to the problem;
- correcting any inaccurate statements;
- discussing problems of solution within a particular national setting.

Role of chairman

Impartial, involved chairman

The main role of the chairman of a plenary session, is to ensure that the objectives of the session are achieved. The chairman's task can be split into four main components: preparation, introduction, transaction and conclusion.

Preparation

It may be an advantage to have a short meeting with the different syndicate chairmen before the session, to explain procedures, see that all documentation is available, and any visual aids and hardware which might be required are prepared beforehand.

Introduction

The plenary session for a particular task may be held some time after the end of the syndicate work. The participants may have involved themselves in a subsequent task, In consequence, it is desirable for the chairman of the plenary session to introduce the session by reminding the participants of both the objectives of the task and the task itself. It is also advisable to state the methodology that will be used for the presentation of the reports and for the discussions.

Transaction

While conducting the session, the chairman must control the plenary session by nominating or calling upon the speakers and ensuring the smooth transaction of business. This usually involves provoking participants to discuss the various aspects and carefully allotting time to as many of the participants as possible.

Conclusion

Once the objectives have been set, it should be a relatively easy matter for the chairman to conclude the plenary session by comparing the objectives with what has happened in the discussion. This could involve a comparison and evaluation of the various reports, and a summarizing of the main findings.

Role of other facilitators

The facilitators should assist the chairman in the smooth running of the session and, if necessary, in provoking discussion. It is essential that they guard

against defending the position of the particular syndicate group in which they have been involved. They must also guard against dominating the plenary session.

Summary of suggestions

1. Develop aims and objectives for syndicate tasks in general.
2. Give aims and objectives for each syndicate task.
3. Indicate possible resources for each syndicate task.
4. Indicate alternative approaches for considering each syndicate task.
5. Provide 'Notes' for each syndicate task.
6. Build variety into the syndicate tasks.
7. At least one facilitator should be present at all times in a syndicate group.
8. At least one facilitator should remain with a syndicate group throughout the workshop.
9. Syndicate facilitators should meet with the workshop co-ordinator before each task.
10. Facilitators should assist syndicate chairman and secretary.
11. Aims and objectives of plenary sessions should be provided to all concerned.
12. Chairman and facilitators should draw support and encourage the participants to achieve the objectives of the plenary sessions.

Appendix II

EVALUATION OF THE WORKSHOP

The development of criteria and evaluative instruments for evaluating the Workshop was the last task the participants undertook as an operation of the Workshop. After a detailed discussion of a plenary session of the criteria to be utilized in the evaluation, participants returned to their syndicate groups to develop the separate parts of the evaluation instrument. The criteria agreed upon by the plenary were :

1. Specific objectives of the Workshop as stated in the prospectus
2. Learning materials
3. Facilitators
4. Plenary sessions
5. Syndicate work
6. Syndicate report
7. Country plans
8. Assignments
9. Time, facilities and organization
10. Open ended comments.

Development of instruments to reflect the various criteria were taken up as follows :

Criteria 2, 3, 4, 5	Syndicate A
Criteria 6, 7, 8	Syndicate B
Criteria 9, 10	Syndicate C

These instruments were combined in the manner developed in the Syndicates, without attempting to homogenize them in style or detail, retaining the individuality of the write-ups. The total instrument was circulated to the participants on the morning of Friday, 1 December 1978, and the results analysed and discussed at the plenary. Participants, while responding to the questions in the instruments, were made aware of the ambiguities and short-falls of the instrument, as a further learning exercise. The instrument was meant to be used for tryout and further refinement. The Appendix II, records the unedited version of the instruments and the analysis. Analysis was done by a committee set up by the participants.

In preparation for the country follow-up actions, participants will further revise the instruments for their use in country workshops, and transmit them to the Unesco Regional Office, together with their revised country plans. These will be kept on record at the Regional Office for follow-up action as indicated in the Recommendations.

EVALUATION OF THE WORKSHOP

(Showing mean ratings of all participants' evaluations)

Date - - - - - - - - - - - - - - - Write your name (optional) - - - - - - - - - - - -

Instructions: Put a cross on the numeral that best indicates to what extent the workshop attained each of the objectives as stated in the prospectus, as far as you are personally concerned on the line opposite each, considering 1 as the lowest value and 5 as the highest. (From *poor* to *excellent*)

	Specific objectives of the Workshop	The extent of achievement	Mean rating
1.0	To increase basic knowledge of the techniques of systems analysis including its philosophy, terminology and processes	1 2 3 4 5	4.2
2.0	To develop skills to apply systems analysis to educational problems at micro- and macro-levels, specifically,	1 2 3 4 5	4.1
2.1	To analyse macro- and micro-level activities for in-service teacher education programmes at the first cycle of education of a country including:		
	– Problem identification and specification of objectives	1 2 3 4 5	4.2
	– Input assessment (resources as constraints)	1 2 3 4 5	4.2
	– Determination of alternative solutions	1 2 3 4 5	4.0
	– Design for executing preferred solution	1 2 3 4 5	3.8
	– Tryout/adjustment of execution design	1 2 3 4 5	3.7
	– Wider execution of improved design	1 2 3 4 5	3.7
	– Evaluation/feedback/reformulation of cycle	1 2 3 4 5	4.0
2.2	To develop programmes for in-country and regional multiplier actions, including:		
	– A plan of action for in-service education at the first level of education for the country	1 2 3 4 5	4.1
	– Guidelines for design and development of training programmes and supportive resources for enhancing national capacities for use in systems approaches	1 2 3 4 5	4.1
	– Recommendations for possible actions in the region as follow-up of country	1 2 3 4 5	4.1

Give your ratings for other important elements of the Workshop on a 5-point scale ranging from *poor* to *excellent*.

3.0	Learning Materials		
3.1	Relevance to systems approach concepts	1 2 3 4 5	4.7
3.2	Adequacy to attain the objectives of workshop	1 2 3 4 5	4.4
3.3	Timely distribution	1 2 3 4 5	4.3
3.4	Comprehensibility	1 2 3 4 5	4.6
3.5	Quality of production	1 2 3 4 5	4.6

		The extent of achievement	Mean rating
4.0	**Facilitators**		
4.1	Availability of facilitators	1 2 3 4 5	4.8
4.2	Participation/involvement of facilitators	1 2 3 4 5	4.8
4.3	Readiness to assist	1 2 3 4 5	4.9
4.4	Efficiency	1 2 3 4 5	4.6
4.5	Effectiveness	1 2 3 4 5	4.5
4.6	Flexibility	1 2 3 4 5	4.4
5.0	**Plenary Sessions**		
5.1	Sufficiency in time	1 2 3 4 5	4.0
5.2	Appropriateness of time	1 2 3 4 5	3.4
5.3	Organization	1 2 3 4 5	3.8
5.4	Degree of participation of chairman	1 2 3 4 5	3.7
5.5	Degree of participation of participants	1 2 3 4 5	3.8
5.6	Availability of reference materials	1 2 3 4 5	4.3
5.7	Productivity of session	1 2 3 4 5	4.0
5.8	Degree of collaboration among syndicates	1 2 3 4 5	4.0
6.0	**Syndicate Work**		
6.1	Appropriateness of grouping	1 2 3 4 5	4.5
6.2	Appropriateness of group task assignments	1 2 3 4 5	4.5
6.3	Clarity of introductory instructions	1 2 3 4 5	3.7
6.4	Degree of participation	1 2 3 4 5	4.5
6.5	Productivity of session	1 2 3 4 5	4.5
6.6	Quality of presentation of report	1 2 3 4 5	4.0
7.0	**Syndicate Report**		
7.1	The syndicate reports in relation to the objectives of the task was :	1 2 3 4 5	4.0
7.2	The process of identification of problems mentioned in report on task I was:	1 2 3 4 5	4.1
7.3	The statement of objectives of Teacher In-service Education Programme in the report on task I was:	1 2 3 4 5	4.2
7.4	The process of identification of alternative strategies and constraints stated in report on task II was:	1 2 3 4 5	4.2
7.5	The use of systems diagrams in describing the action plans in the syndicate reports was:	1 2 3 4 5	4.6
7.6	The statement of objectives of evaluation mentioned in the report on task III was:	1 2 3 4 5	4.0
7.7	The organization of the syndicate reports was:	1 2 3 4 5	4.0

		The extent of achievement	Mean rating
7.8	The breakdown of syndicate reports in terms of problems and objectives, alternative strategies and evaluation for the programme was:	1 2 3 4 5	4.0
8.0	Country Plans		
8.1	The country plans developed by the participants in terms of the theme were:	1 2 3 4 5	3.8
8.2	The country plans developed by the participants in terms of rationals were:	1 2 3 4 5	3.9
8.3	The country plans developed by the participants in terms of objectives were:	1 2 3 4 5	4.0
8.4	The country plans developed by the participants in terms of designs were:	1 2 3 4 5	3.8
8.5	The country plans developed by the participants in terms of required Unesco assistance were:	1 2 3 4 5	4.0
8.6	The country plans developed by the participants in terms of designs generality were:	1 2 3 4 5	3.7
9.0	Assignments		
9.1	The assignment materials sent to participants in terms of self-learning characters were:	1 2 3 4 5	4.5
9.2	The assignment materials sent to participants in terms of comprehensiveness were:	1 2 3 4 5	4.5
9.3	The assignment materials sent to participants in terms of time required to complete were:	1 2 3 4 5	4.0
9.4	Completing assignments before the workshop as a preparatory phase was:	1 2 3 4 5	4.2
9.5	The assignments given to participants in terms sequence were:	1 2 3 4 5	4.2
10.0	Time, facilities and organization		
A.	Time		
10.1	60 hours of self-learning work before coming for this workshop make the participants ready for the learning experiences	1 2 3 4 5	4.6
10.2	14 days are enough to achieve the objectives of the workshop	1 2 3 4 5	3.6
10.3	Working hours from 8 a.m. to 5 p.m. were not sufficient to complete the tasks	1 2 3 4 5	3.8
10.4	Duration given to explain Systems Approach (theoretical aspect) familiarized the participants with the basic concepts	1 2 3 4 5	4.0
10.5	Allocation of time to syndicate tasks allowed participants to discuss and come to a consensus on the assignments	1 2 3 4 5	4.2

		The extent of achievement	Mean rating
10.6	Time of holding the workshop was appropriate to make changes in country plans	1 2 3 4 5	4.1
B.	Facilities		
10.7	Campus facilities such as light, transport, conference hall, and syndicate hall along with resource material, room, fulfilled the requirements of the workshop	1 2 3 4 5	4.8
10.8	Residential accommodation provided to the participants was conducive to accomplish their tasks	1 2 3 4 5	4.5
10.9	Secretariat assistance facilitated the production of workshop output	1 2 3 4 5	4.8
10.10	Cafeteria services met the needs of the participants in terms of providing the food everyone could eat	1 2 3 4 5	4.6
10.11	Instructional media activated the participants to respond positively to their tasks	1 2 3 4 5	4.5
10.12	Library services gave enough information relating to the tasks	1 2 3 4 5	4.5
C.	Organization		
10.13	Communication between the organizers and the participants in connection with their attendance in this workshop was clear	1 2 3 4 5	3.8
10.14	Participants were informed of their expected role in the workshop	1 2 3 4 5	4.3
10.15	Administration which covers the different aspects of the workshop was conducted efficiently	1 2 3 4 5	4.8
10.16	Administration of the workshop achieved the objectives which were identified in the planning process	1 2 3 4 5	4.4
10.17	Selection of the resource persons was relevant to the achievement of the goals	1 2 3 4 5	4.6
10.18	Library services gave enough information relating to the tasks	1 2 3 4 5	4.5

Further comments on the workshop atmosphere and the incidental learnings gained in the workshop process:

Workshop Atmosphere	Incidental Learning
1. Permissive, warm, more individualized	1. Learning of human relations
2. Involvement oriented	2. Learning is doing itself
3.	3.
4.	4.
5.	5.
6.	6.

Please give your suggestions regarding any aspect of the ***input***, ***through-put*** or ***output*** of the Workshop: (Take additional page, if you like)

Input	Through-put	Output
1. Use of WHAP form should have been explained.	1. Duration was not sufficient.	1. Realistic design of plans should be emphasized.
2.	2. Video tape feedback	2. Necessity of Bibliography on resource material
3.	3.	3.
4.	4.	4.
5.	5.	5.